The Croonian Lectures

ON

THE MEANS BY WHICH THE TEMPERATURE OF THE BODY IS MAINTAINED IN HEALTH AND DISEASE.

Delivered before the Royal College of Physicians of London,

BY W. HALE WHITE, M.D., F.R.C.P. LOND.,
PHYSICIAN TO, AND LECTURER ON PHARMACOLOGY AND THERAPEUTICS AT, GUY'S HOSPITAL.

LECTURE I.[1]

Delivered on June 15th.

MR. PRESIDENT AND GENTLEMEN,—In the first place I have to express my very best thanks for the great honour which our late President, Sir Russell Reynolds, conferred upon me when he invited me to deliver the Croonian Lectures before this College. After I had said I would deliver them I looked down the list of my predecessors, and since I saw how distinguished a list it is I have often regretted my boldness, and I can assure my hearers that no one is more fully aware than I am of the many deficiencies in the lectures I am about to give.

I propose in them to discuss the details of the means by which the temperature of the body is maintained in health and disease. My hearers will find that many points are omitted, but when they call to mind the great complexity of the subject and the scantiness of our knowledge they will, I am sure, forgive me.

I have purposely avoided the word "fever" in the title of these lectures, for it lacks exactitude. It is an admirable word, but it has been handed down from a time when less was known than we know now and when the clinical thermometer was not employed. As we use it to-day it is difficult to define in such a way as to cover every use of it, but probably most of us mean by it to designate a certain assemblage of symptoms which follow the introduction into the body of certain poisons; thus, when an unprotected person is inoculated with small-pox he shows certain symptoms, and is therefore said to have a fever. One of the most prominent of these is pyrexia, but pyrexia may occur, as I shall show, if we remain a long while in a hot bath or as a result of cerebral hæmorrhage. Probably there are some of us who would not consider the man who had had a very hot bath or the man who had a cerebral hæmorrhage to be suffering from fever, but a study of the raised temperature in these conditions will help us to understand the pyrexia which occurs in cases to which everyone is agreed the term "fever" may be applied. Another reason for confining ourselves in these lectures to pyrexia rather than fever is that this term comprehends so many symptoms—e.g., rapid pulse and rapid respiration—that we should not have time to consider them all.

Before studying pyrexia experimentally there are some pitfalls of which we must beware. In the first place, the normal range of temperature in the lower animals is wider than in man. I have very often taken the rectal temperature of rabbits, dogs, and monkeys, and in these animals the range is greater than in man. I have compiled from Dr. Pembrey's article on Animal Heat in Professor Schäfer's forthcoming "Physiology" the appended table (Table I.), which shows very well the range of temperature in different animals.

In the next place the prolonged administration of an anæsthetic causes a fall of temperature. Thus, Pembrey[2] has proved that the temperature falls in anæsthetised mice, and Binz,[3] quoting from Kappeler, says that after the administration of ether to human beings the bodily temperature sinks from 0·3° to 1·5° C. (the mean of twenty etherisations was 0·68° C.); but it rises again in a few hours to normal.

[1] Lecture II. was delivered on June 17th, and Lectures III. and IV. will be delivered on June 24th and 29th respectively.

[2] Proceedings of the Physiological Society, Feb. 16th, 1895.

[3] Lectures on Pharmacology, Sydenham Society translation, vol. i., p. 11.

Twenty-three observations were made on the effect of chloroform on human beings, and it was found that on the average the temperature fell 0·53° C. The fall did not begin till at least twenty minutes after commencing inhalation and was generally most marked after narcosis had passed off. In from twenty minutes to five hours the normal temperature was

TABLE I.

Animal.	Average rectal temperature.	Extremes of observations.	Number of observations.
	Degrees C.	Degrees C.	
Horse	37·8	36·1—38·6	962
Cow	38·7	37·5—39·4	116
Sheep	40·4	38·5—41·8	304
Dog	39·0	37·1—39·9	250
Cat	38·7	37·9—39·7	41
Pig	39·2	38·7—40·8	289
Rabbit	38·9	37·0—40·8	110
Guinea-pig	37·9	37·0—39·2	19
Rat	37·5	37·0—38·5	16
Mouse	37·4	37·1—38·6	27
Monkey (Rhesus) ...	38·4	36·9—39·7	22

regained. Binz, quoting from Scheinesson, says that anæsthetics do not increase the dissipation of heat, and he considers that they directly diminish the power of the body to produce heat. But in rabbits at least I can, from personal observation, state that if the anæsthetic is only given for two or three minutes no appreciable alteration of temperature takes place.

Another fallacy to be avoided in the experimental study of pyrexia is that the performance of artificial respiration will by itself cause a considerable alteration of temperature. This is particularly unfortunate, for at first sight it seems as though we might learn much about pyrexia from a study of the behaviour of the temperature when the spinal cord is cut or curare has been given; but as in either case artificial respiration would be necessary these modes of experiment are closed to us. Le Gallois[4] as long ago as 1817 showed that artificial respiration depressed the temperature, and also that to a less extent anything—such as tying an animal down—which hindered respiration caused the temperature to fall. Dr. Fawcett and I in the course of some experiments we were conducting on the physiological action of β-tetrahydronapthylamine made some observations upon the combined effect upon the temperature of etherisation and artificial respiration. Rabbits were used, the animal was kept fully under ether for two hours, and during this time it was fixed to a board in the usual way, and artificial respiration was carried on through an opening in the trachea. The following table (Table II.) shows the results we obtained.

TABLE II.

Number of experiment.	Fall of temperature.	Hours during which it fell.	Remarks.
	Degrees C.		
1	4·8	3¼ hours.	
2	2·2	2¼ ,,	These two animals were wrapped in cotton-wool.
3	3·4	3½ ,,	

It will be seen that the depression of temperature was very considerable and that it could not be prevented by wrapping the animal in cotton-wool. It is clear, therefore, that as the combined influence of ether, artificial respiration, and fixing a rabbit to a board produces such a marked fall in the animal's temperature, this method of experiment is quite inapplicable for working out problems dealing with the variations of temperature of rabbits. We may now leave the fallacies and pass on to the chief subject of these lectures.

The fundamental problem in a study of pyrexia is to discover whether or not the production of heat is increased, for it is clear that the temperature of the body may rise either because the loss of heat from it is less, while the

[4] Annales de Chimie et de Phys., IV., 1817.

p oduct on remains the same, or because the loss of heat ren ains the same while the production of heat is increased, or, f both vary, because the variations in the production have not been exactly counterbalanced by variations in the loss. The opinion of the profession upon the question whether in fever the rise of temperature is due to a diminution of the loss of heat or an increase of production has varied in accordance with the views of our most distinguished pathologists. Thus Traube taught that the rise of temperature in fever is due to a contraction of the superficial arterioles, there being then less blood in the skin, the body consequently loses less heat by radiation and conduction and hence its temperature rises. Liebermeister, on the other hand, taught that the increased temperature in fever was due to a greater production of heat. But it appears to me to be possible that the discussion has in a sense been beside the mark, for we know that most, if not all, fevers are due to the circulation of poisons in the blood and there is no reason why we should believe that they all produce pyrexia in the same way. All collateral evidence is against such a view; many poisons accelerate the beat of the heart, but some act upon the vagus, others upon the accelerator nerves; many poisons produce diaphoresis, but jaborandi acts upon the peripheral terminations of the sudoriparous nerves while opium acts centrally. And I hope I shall, in these lectures, be able to bring forward evidence to show that sometimes pyrexia is due to an increased production of heat and sometimes to a diminution of the loss. If this can be done it will put an end to the discussion as to whether in fever the production of heat is increased or the loss diminished; but we shall have to discuss the question for each separate febrile disease.

Before however, doing this I should like to call attention to a point that I have never seen discussed—namely, whether there is any evidence that pyrexia may be due to a variation in the specific heat of the body. It takes more heat units to warm to a given temperature a body with a high specific heat than it does to warm a body with a low specific heat to the same temperature, so that if the specific heat of the human body diminished while its production and loss of heat remained the same its temperature would rise; and at first sight it appears that this would be a most economical way of raising the temperature, as there would be no extra expenditure of energy in increasing the production of heat; but perhaps the alteration of the specific heat of the body might entail such considerable molecular change that it would necessitate an expenditure of energy. Most observers have estimated the specific heat of the body by calculation after death from that of the various tissues of the body. The lowest estimate given by this method is 0·75, the highest 0·9; but this is what might have been expected when we remember that a large proportion of the body is water. The properties of dead and living bodies are so unlike, and the specific heat of complex substances is often so difficult to foretell, that I thought it would be worth while to see if some means could be devised of estimating the specific heat of living animals. This would be easy enough in the case of cold blooded animals by observing the relative number of degrees of temperature through which the animal and an equal weight of distilled water originally at the same temperature rose or fell when both were, under exactly similar conditions, subjected to warming or cooling, for it is well known that the temperature of cold-blooded animals rises and falls with that of their surrounding medium. But the thermic mechanism of warm- and cold-blooded animals is so different that it would be rash to assume that the specific heat of warm-blooded animals is the same as that of cold-blooded animals.

It struck me, however, that by using hybernating mammals it would be possible to calculate the specific heat of living animals not far removed from man. I employed dormice, for they are easy to obtain and to observe. When hybernating they lie tightly curled up in a ball, with their feet tucked away in the centre of the ball, and it is easy to take their temperature by placing the bulb of a thermometer in the centre of the ball. The first point to determine was whether when they are hybernating their temperature rises and falls with that of the surrounding medium. The figures given in Tables III. and IV. show that it does. For example, it will be seen in Table III. that when the temperature of the room was 37° F. that of the dormouse was 37·5°, and that when it was brought into a room at 52° its temperature slowly rose till it was 49·25°; it was then put back into the cold room and its temperature slowly fell. A large number of observations gave similar results; but the experiment requires to be made with considerable care for many reasons, each of which will be found in a paper which I published.[8]

The method of experimenting was as follows. The hybernating dormouse was carefully weighed. It was then placed on the bottom of a thermometer stand, exactly like an ordinary test-tube stand in which the test-tube stands mouth upwards, except that the holes were only large enough to take a thermometer. The bulb of a thermometer was left buried in the centre of the ball formed by the hybernating dormouse. A number of cubic centimetres of distilled water equal to the weight of the dormouse in grammes were then measured into a very thin, bright, platinum vessel, which had been made to hold just about the right amount. This vessel with its contained water was placed on the bottom of the test-tube stand as far removed from the dormouse as possible. A thermometer was placed in it. The temperature of the surrounding air close to the thermometer stand was observed. All three thermometers had been tested beforehand to see that they gave similar readings. Sufficient time was allowed for all three thermometers to become

TABLE III.—*Weight of Dormouse 13·55 grammes.*

Time.	Temperature of dormouse.	Temperature of equal weight of distilled water.	Specific heat from these figures.	Temperature of room.
	Deg. F.	Deg. F.		Deg. F.
9.10 A.M.	37·5	37·5	—	37
	Both brought into a warm room.			
9.35 ,,	43	42	$\frac{4·5}{5·5} = 0·818$	50
10 ,,	47	46·25	$\frac{3·75}{9·5} = 0·921$	50·5
10.30 ,,	48	47·25	$\frac{9·75}{10·5} = 0·928$	51·5
11 ,,	49·25	48·25	$\frac{10·75}{11·75} = 0·915$	52
	Both taken into a cold room.			
11.30 ,,	43	43	$\frac{5·25}{6·25} = 0·840$	37
11.50 ,,	40·75	40	$\frac{8·25}{8·5} = 0·970$	37
12.20 P.M.	39	38	$\frac{10·25}{10·25} = 1·0$	37

TABLE IV.—*Weight of Dormouse 13·5 grammes.*

Time.	Temperature of dormouse.	Temperature of equal weight of distilled water	Specific heat from these figures.	Temperature of room.
	Deg. F.	Deg. F.		Deg. F.
10.59 A.M.	40	40	—	40
	Both brought into a warm room.			
11.15 ,,	43·5	43	$\frac{3·0}{3·5} = 0·857$	50
11.40 ,,	46	45·5	$\frac{5·5}{6·0} = 0·917$	51
11.55 ,,	47·5	47	$\frac{7·0}{7·5} = 0·933$	52
12.7 P.M.	48	48	$\frac{8·0}{8·0} = 1·0$	52
12.30 ,,	49·5	49·5	$\frac{9·5}{9·5} = 1·0$	52
	Both taken into a cold room.			
12.57 ,,	44	43	$\frac{6·5}{5·5} = 1·182$	36
1.10 ,,	43	42	$\frac{7·5}{6·5} = 1·154$	36

[8] Journal of Physiology, Supplementary Number, 1892.

steady. The thermometer stand with the dormouse and the water on it were then taken into a room of a temperature about 50° F., and the readings given by the thermometer which was buried in the dormouse and by that in the water were noted from time to time. When that of the dormouse was about 50° F. the thermometer stand was moved back into the cold room and the readings were again noted. It is clear that as the temperature of the dormouse rose and fell with that of the air, the number of degrees an equal weight of distilled water rose or fell divided by the number of degrees the temperature of the dormouse rose or fell in the same time will give the specific heat of the dormouse. I performed many experiments and found that, calculated in this way, the specific heat of the dormouse varies between 0 812 and 1·18, so that if we set it down at 0 95 we shall probably be very near the mark. It is noteworthy that when the thermometer stand was first brought into a warm room the earlier observations always gave a slightly lower specific heat for the dormouse than the later ones, because at first the rise of the temperature of the animal was, in comparison with the rise of that of the water, slightly the faster. The consequent slight increase in the creature's specific heat was often uniform. Thus in Table IV. the first observation gave a specific heat of 0 857; according to the second it was 0·917; according to the third it was 0 933; and according to the fourth it was 1·0. Another noteworthy fact is that if the specific heat was calculated from observations made when the thermometer stand had been removed from a warm room into a cold one, it was always slightly higher than if calculated from observations made when the stand was brought from a cold into a warm room, and also the earlier observations gave the lower specific heat.

The close agreement of these results with those obtained by calculation from the dead tissues shows, I think, that we may safely put down the specific heat of dormice as being slightly below that of water. There are in these experiments several possible fallacies, but I think I have shown in the paper referred to that they are unimportant. Because of these unavoidable fallacies the specific heat obtained by this method is only approximately accurate, but reference to the paper just mentioned will show that the fallacies lead to only a slight error, and that on the whole the specific heat calculated by this method is slightly too low. Probably the results are more accurate than those obtained by calculating the specific heat of each of the tissues of the dead body and from these results estimating the specific heat of the body as a whole. It will be observed that the figures obtained by the two methods are in close accord, but that by the method here given the specific heat appears higher than when calculated from the dead tissues.

I should not have introduced these figures had I not wished to show that whether we calculate from dead or living tissues the specific heat of the body is high, and it is obviously an advantage for warm-blooded animals, having, as they have, to maintain a constant temperature, to have a high specific heat, for bodies with a low specific heat cool much more readily when the temperature of the surrounding medium falls than do those with a high specific heat; and although it would be unfair to definitely apply results obtained from hybernating dormice to a man suffering from fever, I think we may say that at present there is no evidence that in man the rise of temperature is due to a diminution of the specific heat of the body, as whatever the temperature of these dormice their specific heat varied very little, for reference to the paper from which I have quoted will show that experiments conducted for the same time usually gave nearly the same specific heat. Further, there is no reason to believe that the human body disobeys the law that the specific heat increases with the temperature and therefore until the contrary is proved we must suppose that, other things being equal, it takes a few more calories of heat, and therefore requires a greater production of heat to raise the temperature of the body from 104° to 105° than it did to raise it from 98° to 99°.

We now pass on to a consideration of the question whether or not in pyrexia the production of heat is increased or the loss diminished. There are three ways by which this may be investigated:—(1) By comparison of the variations in the loss of heat with the variations of internal temperature; (2) by calorimetry; and (3) by chemical means; and it will be convenient if we consider them in this order.

1. COMPARISON OF THE VARIATIONS OF THE LOSS OF HEAT WITH VARIATIONS OF INTERNAL TEMPERATURE.

The communication which Dr. Waller made to the Physiological Society on Nov. 11th, 1893, suggests the possibility of easily finding out whether in man the production of heat is increased when the temperature is raised, and of studying in detail the means employed to keep the temperature constant in health. It is clear that when the surface temperature of the body rises the loss of heat by radiation and conduction will be increased, and that when the amount of sweat secreted is increased the loss of heat from evaporation is increased, so that if in any case it can be shown that the internal temperature has risen, and at the same time the surface temperature has risen and the amount of sweat secreted has increased, the production of heat must have increased, provided that the temperature of the surrounding air is constant, and in the wards of a hospital it is kept nearly so. I will now describe the means I have employed to obtain these data.

The internal temperature.—This is taken with an accurate self-registering clinical thermometer. When only slight variations are expected it should be taken in the rectum or the axilla, for the rapidity of respiration and the temperature of the respired air affect the mouth; but when, as in many cases of fever, the temperature is raised several degrees above normal, an observation taken in the mouth will suffice, and if the observer is single-handed it is a great convenience to take it in the mouth, for the internal temperature, that of the surface, and the amount of sweat secreted should all be observed simultaneously.

The surface temperature.—This should be taken with a flat-bulbed thermometer held gently on the skin until the index is stationary; if it be held too firmly the pressure exercised will send up the mercury. Suitable thermometers can be obtained from A. Deane, of Hatton-garden. The skin of the abdomen near the umbilicus is the best place to take the temperature, for whether the person observed have his clothes on, or whether he be in bed, the skin here is less liable than that elsewhere to transient variations of temperature from exposure to currents of air. The temperature registered by the thermometer does not represent that of the skin with absolute accuracy, for part of the bulb is exposed to the air, and the skin covered by the bulb slowly gets warmed because the bulb protects it, but as my object has always been to obtain comparative, not absolute, results these errors are of no importance. The following observation demonstrates very well that these thermometers readily show variations of surface temperature. I exposed the extensor surface of my forearm for some hours to the sun, the vessels consequently dilated, and the part was red, the surface thermometer showed the temperature at a spot well inside the margin of the red area to be 34 25° C., one-third of an inch outside the margin—the vascular dilatation here being just visible—it was 33 25°; and some distance from the red patch the temperature was 32·5°. I have tried this experiment several times and the differences are always well shown. It is of interest to observe that even extreme vascular dilatation quite as great as is observed in any fever, only increased the surface temperature of the skin 1 75° C.

The estimation of the sweat.—This was estimated by using calcium chloride as an absorbent. It was fused into the bottom of a shallow circular glass box. All the boxes used in the observations had air-tight lids, and the inside diameter of all was the same—viz., 4·5 c.m.—and therefore the area of the bottom of each box was 15·9 square c m. The inside depth was about 2 c.m. The best way to make the calcium chloride adhere to the glass is to take fine pieces of it, place them in the bottom of the box, and then add a trace of absolute alcohol. The box is then put into an oven, which is slowly heated so that in an hour it is 150° C., and then the oven is left to slowly cool again. The absolute alcohol contains minute traces of water, and this is just sufficient to soften the edges of the pieces of calcium chloride enough to agglutinate them, and this water is driven off by the heat; the alcohol, too, acts as a slight solvent. When a reading is taken the box is held inverted on the skin for a given time (in the observations I have made I have, except in a few preliminary cases, always held it for ten minutes) and the difference in its weight before and after gives the amount of sweat secreted. It is best held with one finger so that the heat of the hand shall not affect it To obtain accurate results the boxes must not be weighed directly after they are removed from the skin, for the glass has been

warmed by the skin, consequently it displaces more air and warm air currents proceed from it while it is on the pan of the balance, and I always found that as it cools its weight slowly increases.

The following figures, Table V., show this. I tightly held

TABLE V.

Weight of box and lid before box was put in the palm	75·4593 grms.
Weight of box and lid directly after box was taken off at 9.45 P.M.	75·4625 ,,
Gain	0·0032 grms.
Weight at 10.15 P.M.	75·4644 grms.
Weight at 10.45 P.M.	75·4652 ,,
Weight at 11.30 P.M.	75·4658 ,,
Weight at 11.45 P.M.	75·4658 ,,
Total Gain	0·0065 grms.

the box with its lid off inverted on the palm of one hand, pressing it down with the palm of the other for five minutes, so that it was completely shut up in the clasped hands. Directly the five minutes was up the air-tight lid was put on the box. This table shows that the amount of sweat secreted from the palm in five minutes really was 6·5 milligrammes, not 3·2 milligrammes, as a reading taken at once would appear to show, and the weight of the box and lid did not become constant until more than an hour had elapsed from the removal of the box from the hand. But this was an extreme experiment, the box was warmed considerably by being grasped in the closed hands. When it is held on with one finger the weight becomes constant in half an hour, and probably often in less. The following figures show this (see Table VI.).

TABLE VI.

Weight of box and lid before box was put on the palm	81·6438 grms
Weight of box and lid directly after it was taken off, 10 P.M.	81·6482 ,,
Gain	0·0044 grms.
Weight at 10.30 P.M.	81·6499 ,,
Weight at 11 P.M.	81·6499 ,,
Total gain	0·0061 grms.

Here an immediate weighing appeared to show a gain of only 4·4 milligrammes, but the gain really was 6·1 milligrammes. Therefore it is clear that to get accurate results the boxes must not be weighed till some little time after they are removed from the body. When the box is weighed before the observation it contains air at the temperature of the room, but when it is inverted over the skin it contains warm rarified lighter air, and as the box itself is warm after it is taken off the skin the air in it when the lid is put on is still rarified, and when it is weighed as the cover is air-tight it still contains lighter air than it did before the experiment began. To show this I just lifted the lid and instantly closed it again, when after an experiment the box had been left till its weight was constant. For example, in the last experiment detailed the box weighed 81·6499 grammes. The lid was lifted and immediately closed again; the box then weighed 81·6501 grammes, a gain of 0·2 milligramme. As other experiments also showed that the gain was only 0·1 or 0·2 milligramme it is clear that no account need be taken of this varying density of the air, especially as some of this gain that is only shown in the fourth place of decimals may be due to absorption of moisture from the air let in.

Another possible source of error is the condensation of moisture on the boxes; but the amount in the air in a room does not vary much in three quarters of an hour, and the box was not weighed after an observation until its temperature had become the same as it was when it was weighed before the experiment, so that this source of error is not important. It can, however, always be avoided by having in one pan of the balance a dummy empty box exactly like the one used for experiment, and weighing one against the other both before and after the observation and noting the excess of the difference between the weights of each box. It would probably not be desirable to invert the empty dummy box on the skin at the same time as the box containing calcium chloride and leave both boxes on for the same length of time close to one another, and then to weigh them one against the other immediately after; for though they would both have been warmed by the skin, yet we have seen that the error due to this warming of the boxes may be so considerable that if the two boxes had not taken up equal amounts of heat from the skin the result of observing the alteration of the difference in their weights would not be trustworthy, and it is unlikely that they would have taken up equal amounts, for one box has calcium chloride in it and the other has not, and the amount of glass in the boxes is variable. But whether the method of dummy boxes be adopted or that, which is probably more accurate, of leaving an air-tight box to cool, an air-tight lid is a necessity; for if it is not used the results will be inaccurate, because the calcium chloride will absorb moisture during each weighing, and also if no lid is used the observation must be carried on directly opposite the balance, and immediately after the box is weighed it must be put on the skin, and immediately after it is taken off it must be again weighed, but in clinical work the balance can hardly be carried to the bedside of each patient. The lids of the boxes I used fitted on like a cap, and where the lid came in contact with the box the glass of each was finely ground; if then the merest trace of vaseline was put on the ground glass the boxes became quite air-tight enough. This I proved over and over again by leaving the boxes with calcium chloride in them but with the lids on about the laboratory, and weighing them at intervals of some hours. For instance, six such boxes were left in the laboratory for twenty-six hours during which the air happened to be nearly saturated. The gains in weight are shown in Table VII.

TABLE VII.

Box 1	gained	0·0001	grm. in	twenty-six hours.
,, 2	,,	0·0002	,,	,, ,,
,, 3	,,	0·0003	,,	,, ,,
,, 4	,,	0·0006	,,	,, ,,
,, 5	,,	0·0008	,,	,, ,,
,, 6	,,	0·0010	,,	,, ,,

On another occasion two boxes gained in weight in twenty-six hours 0·1 and 0·2 milligrammes respectively. It is clear, therefore, that if the boxes are weighed within an hour or two of an observation there is no appreciable error due to absorption of moisture from the air. In the next lecture we will consider some examples of this method.

An Address

ON

PELVIC HÆMATOCELE CONSIDERED FROM THE MODERN STANDPOINT.

Delivered before the Nottingham Medico-Chirurgical Society on Friday, March 26th, 1897,

BY CHAS. J. CULLINGWORTH, M.D. DURH., F.R.C.P. LOND.,

PRESIDENT OF THE OBSTETRICAL SOCIETY OF LONDON; OBSTETRIC PHYSICIAN AND LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AT ST. THOMAS'S HOSPITAL, ETC.

GENTLEMEN,—I feel it an honour to have been invited to address you this evening. Being but a comparatively recent importation into the medical life of London, my sympathies remain largely provincial, and I appreciate any compliment from my provincial friends with the peculiar heartiness that springs from old association and from an intimate knowledge of the debt that the profession owes to a multitude of earnest workers and close thinkers in the great provincial towns. Amongst these, Nottingham, in regard to the solidity and importance of its recent contributions to medical knowledge, occupies a conspicuous place. I allude especially to the valuable researches lately published by your president—researches that have made his name familiar to all who are interested in the advance of medical science. In my own department Nottingham is well known as belonging to the more active

and advanced school of gynæcology, and in selecting a subject for my address I have had this fact in mind. I have come prepared, not to deliver a clinical lecture, but to compare experiences with those who are working in the same field, so that we may, if possible, assist one another in the simplification of what has long been regarded as a difficult and complicated problem.

Most of you will remember the feeling of despair with which one arose from the perusal of the chapter on pelvic hæmatocele in one's text-book. The account of its etiology failed to carry conviction. Even what seemed to be definite had an air of speculation and of armchair pathology, and the acknowledged rarity of most of the conditions assigned as causes of hæmatocele did not fit in with our knowledge of its frequency. Even Bernutz, with his admirable series of well-recorded cases and observations of post-mortem appearances, was tempted to build up a theory which would not bear criticism. I allude more especially to his views on menstrual regurgitation as the most common cause of hæmatocele. The history of our knowledge of pelvic hæmatocele has, however, been so recently and so well given in the article on Hæmatocele in Allbutt and Playfair's System of Gynæcology, that I will not occupy your time by further allusion to it beyond paying to Lawson Tait the tribute that is undoubtedly his due, of having been the first to sweep away the existing confusion and, by showing the true cause of the vast majority of pelvic hæmatoceles, to simplify the subject and to give this affection its proper place in pelvic pathology.

In speaking of pelvic hæmatocele I speak of an intra-peritoneal effusion of blood in the pelvis, usually situated behind the uterus and displacing it, and limited towards the general cavity of the peritoneum by encapsulation or adhesions. I do not include unlimited effusions of blood into the peritoneal cavity on the one hand, or effusions of blood in the connective tissue of the broad ligament on the other. Neither of these should in my opinion be called hæmatoceles; the former are simply free intra-peritoneal hæmorrhages; the latter pelvic or intra-ligamentous hæmatomata. It may be that in the near future it will be convenient to describe them in the same chapter, as being for the most part due to causes which are closely allied, if not absolutely identical, and as representing merely accidental differences of site and extent But at present, at any rate, it is usual to think of them and to deal with them separately.

Taking, then, pelvic hæmatocele in the restricted sense I have just explained, it is now pretty generally agreed that in at least nineteen cases out of every twenty the effusion, when not traumatic in its origin, is in one way or another the result of tubal gestation. In the article to which I just now alluded the writer has expressed his personal dissent from this view. It is to be observed, however, that the value of the article is mainly historical, the writer's position as a non-operating gynæcologist depriving his opinion on points of pelvic pathology of the weight that might have attached to it had he not thus been debarred from frequent opportunities of seeing for himself the condition of the parts implicated. Clinical observation, taken alone, is an unsafe guide in regard to the diseases of the female pelvis. In no department of medicine is it more necessary that close clinical observation should be supplemented by actual inspection in the operating and post-mortem rooms. Without such inspection the clinical observer can but make shrewd guesses at the true interpretation of what he sees and hears and feels. In many instances he has landed himself in a region of pure conjecture. The gynæcological manuals are, or were until recently, full to overflowing of theories dressed up in the guise of recognised facts. I could mention several pelvic ailments that have practically disappeared from the modern gynæcologists' nosology owing to the gradual recognition of the lessons learnt in the operating and post-mortem rooms.

In considering the relationship of pelvic hæmatocele to tubal gestation it is necessary to bear in mind the unfavourable conditions under which the ovum is placed when, instead of passing on, as it normally should, into the cavity of the uterus it is detained in the Fallopian tube. The surroundings of the ovum under such circumstances are ill-adapted for the function they are called upon to fulfil. The walls of the Fallopian tube have no such rich blood-supply as those of the uterus. The result is that the ovum fails to obtain the nourishment necessary for its satisfactory development. There is a certain increase in the number and in the size of the tubal vessels, but in spite of this the vascular connexions between the ovum and the maternal tissues are always more or less insufficient. Hence, no doubt, the frequency with which the embryo meets with an early death in cases of tubal gestation, and hence also the liability to hæmorrhages in and around the membranes and to the formation of tubal moles. But it is not the vascular supply alone that is unsuited for the wants of a developing ovum, the mucous membrane and muscular coat of the tube wall are equally so. There is no properly constituted decidua to contribute to the formation of the placenta and give it firmness of attachment and definiteness of outline, and the muscular coats in the tube-wall, instead of responding to the stimulus of pregnancy and undergoing the remarkable development and hypertrophy that the uterine muscle undergoes in normal pregnancy, becomes thinner and thinner, until, under the influence of some slight effort, the tube-wall gives way, the site of the rupture being the spot where the penetration of the chorionic villi has made it especially weak. I am not professing to give an account of tubal gestation, and therefore will not enlarge upon these points. At the same time, it seemed desirable to call to mind the anatomical reasons for the well-recognised instability of the fecundated ovum when it has accidentally failed to reach the uterus, its proper home. The phenomena which lead to and accompany tubal rupture are now well known. The tube-wall, becoming more and more thin as it becomes more distended by the growing ovum, is often stretched still further by the occurrence of an intra-tubal hæmorrhage. Such a hæmorrhage may of itself be sufficient to cause rupture by occasioning a sudden increase in bulk of the contents of the gravid tube; if not, a slight additional shock or strain will be all that is now necessary to produce it. The accident occurs usually between the fourth and the twelfth week. Sometimes only a small rent takes place at first, to be followed by an extension of the tear some hours or days later. We are all familiar with the diagrams illustrating the two great varieties of tubal rupture. In the one the rent occurs in that part of the circumference of the tube where there is a covering of peritoneum. The hæmorrhage in this case takes place into the peritoneal cavity. If the ovum itself or any part of it escapes through the rent along with the stream of blood, this extrusion is necessarily also into the cavity of the peritoneum. In the other and much less frequent variety the rent is situated in the inferior portion of the tube—that, namely, which is uncovered by peritoneum, in which case the extrusion of the ovum and the hæmorrhage take place into the connective-tissue between the two peritoneal coverings of the broad ligament. This is known as intra-ligamentous or extra-peritoneal rupture, and the swelling in the broad ligament occasioned by the extravasated blood is known as hæmatoma of the broad ligament. Some writers, unfortunately in my opinion, speak of it as extra-peritoneal hæmatocele. The subsequent fate of the ovum, when it has thus escaped whole or in part into the mesosalpinx, need not now detain us. It is only necessary to remind you that a secondary rupture into the peritoneal cavity may take place subsequently, the products of conception and accompanying extravasation of blood escaping through a rent in the peritoneal covering of the broad ligament. Whether the blood, poured out into the peritoneal cavity by primary rupture into that cavity as in the first variety, or by secondary rupture, as in the second variety, forms an intraperitoneal hæmatocele, or remains free in the peritoneal cavity without encapsulation, depends chiefly on the extent of the hæmorrhage and the rapidity with which the blood is poured out. In other words, it depends on the number and size of the torn bloodvessels. If the hæmorrhage is considerable and takes place rapidly, as is the case where one or more large vessels are torn, there is not time for the blood to accumulate in the pelvis and surround itself with a roof of adherent viscera or a capsule of coagulated fibrin. The blood escapes into the general peritoneal cavity and remains diffused amongst the abdominal viscera. I shall show presently that this is what occurs in by far the majority of cases of intra-peritoneal rupture of a tubal pregnancy.

I now pass to the consideration of another group of cases, in which, owing to the causes I have already enumerated, one or more hæmorrhages occur between and around the coverings of the ovum, but in which rupture does not take place. This occurrence is described by some writers as the formation of a tubal mole, by others as apoplexy of the ovum. The usual result is that the embryo is destroyed by

the pressure and that the amniotic sac is flattened and compressed against the wall of the tube by the intra-tubal blood clot. Mr. Bland Sutton has shown that in most cases of tubal gestation the abdominal ostium of the pregnant tube becomes occluded from the sixth to the eighth week. Up to the sixth week it is open—often, indeed, unusually patulous. It is clear that so long as the abdominal ostium of the tube remains open—i.e., up to about the sixth week in the majority of cases—it is possible for the blood poured out into the interior of the tube to escape through its open mouth into the peritoneal cavity. It is also clear that the ovum itself, or a portion of it, may be expelled from the interior of the tube into the peritoneal cavity by the same route—that is, through the still open free end of the tube—without rupture of the tube itself. Such an occurrence is called a tubal abortion. Mr. Lawson Tait dislikes the expression as suggesting analogies which do not exist; but it is a useful term, and as it has met with general acceptance it would be pedantic in me to ignore it. Where the entire ovum thus escapes the abortion is said to be complete. Where the embryo alone escapes, the remainder of the ovum still lying within the tube, the abortion is said to be incomplete. Where there is simply hæmorrhage from the open mouth of the tube, without the escape of the ovum or of any part of it, there may be said to be a threatened tubal abortion, though I think the better name is the more lengthy one of "hæmorrhage from the open end of a pregnant Fallopian tube." As a rule such hæmorrhage is not excessive in its amount or poured out in a rapid stream; it is most frequently a continued trickle. The conditions, then, are those which I have already described as being favourable to the encapsulation of the effused blood—that is, to the formation of a pelvic hæmatocele. In rare cases the hæmorrhage occurs too rapidly and in too great abundance for this to take place; and then we have, as the result of this bleeding from the open mouth of the gravid tube, a free effusion of blood amongst the abdominal viscera in the general peritoneal cavity. My chief object is to bring forward some rather striking evidence in favour of the view that pelvic hæmatocele is not usually the result of the rupture of a tubal gestation, as is commonly stated in the text-books, but that it is far more commonly the result of the hæmorrhage I have just described as taking place from the open abdominal ostium of a pregnant but unruptured tube, and that it is only in very exceptional cases of rupture that the blood is poured out in sufficiently small amount and with the requisite deliberation to result in the formation of a hæmatocele. The distinction is more than an academical one; it necessarily influences our views as to treatment. But before giving the figures from my own practice I must allude for a moment to the condition known as hæmatosalpinx, and show what relation this condition bears to the phenomena I have just been describing. Hæmatosalpinx is the name given to an effusion of blood within the Fallopian tube. It is now known that the majority of such effusions are due to tubal pregnancy and the formation of a tubal mole. Mr. Bland Sutton thinks that the term hæmatosalpinx ought to be restricted to the small group of exceptional cases in which the effusion results from some other cause than tubal pregnancy. But, as I have shown in a paper on the subject published in the *St. Thomas's Hospital Reports*, there is a considerable number of cases where the Fallopian tube is found distended with blood-clot, forming a sausage-shaped tumour, and where the evidence of its having originated at a tubal pregnancy is inconclusive. The clinical evidence may be strong, but the most careful search may fail to detect an embryo or chorionic villi or other indisputable product of conception. This being the case, it seems convenient for the present to retain the general term hæmatosalpinx for all effusions of blood within the Fallopian tube, and to qualify the term wherever the evidence is sufficient to warrant this being done, by a few words indicating the source of the effusion in the particular case. In a certain number of cases the evidence is insufficient for definite classification, and in such cases the term hæmatosalpinx seems the most appropriate designation. If Mr. Bland Sutton's suggestion were adopted, the use of that term would imply that the effusion was definitely known *not* to be the result of a tubal pregnancy. It is because there are undetermined cases that I advocate the retention of the term as applicable to all these effusions.

The formation of a tubal mole precedes most cases of rupture—that is to say, the rupture is more frequently the result of the sudden increase in the size of the contents of the tube due to the extravasation of blood than of mere distension of the tube from the growing ovum. We have already seen that hæmorrhage from the unclosed fimbriated end of a gravid tube is also preceded by the formation of a tubal mole. Hence the tube will be found occupied by clotted blood in almost all cases of intra-peritoneal hæmorrhage associated with tubal pregnancy, whether the blood is encapsulated so as to form a hæmatocele or is freely diffused in the general peritoneal cavity, and whether the hæmorrhage be the result of rupture or occur from the open end of the unruptured tube. It follows that there must be a stage, before rupture or before any hæmorrhage occurs from the open mouth of the tube, when the effusion is entirely intra-tubal. In other words, there are cases of tubal mole or hæmatosalpinx without intra peritoneal hæmorrhage. I have myself operated in six such cases. In two of them the ovum was found and in four we failed to discover it. But the clinical history left little doubt that all these cases were instances of hæmatosalpinx due to tubal pregnancy. Had they been left to their fate intra-peritoneal hæmorrhage would have been inevitable, either from rupture of the over-distended tube or from escape of the imprisoned blood from the mouth of the tube. In most of the cases rupture was imminent, as shown by the condition of the tube wall. The size of the intra-tubal clot varies greatly. Sometimes it is not larger than a walnut, but it is much more frequently found large enough to distend the whole of the outer part of the tube, so as to form a firm, elongated tumour from one inch to three or four inches in diameter. For when an ovum has once become apoplectic fresh hæmorrhages are apt to occur, and either the clot becomes more bulky or the blood finds its way out from the mouth of the tube. Hence in most cases of pelvic hæmatocele there is associated with the hæmatocele a hæmatosalpinx. When the hæmatocele is, as I have shown it to be in the majority of cases, due to escape of blood from the open mouth of the unruptured tube, the clot is seen protruding from the dilated mouth of the tube, and to be, in fact, continuous with the contents of the hæmatocele.

Up to the end of January of the present year (1897) I had operated by abdominal section in twenty cases of pelvic hæmatocele. This does not, of course, represent all the cases of pelvic hæmatocele that have come under my observation. I am not prepared with a statement of the precise number of cases that I have had under treatment in hospital or seen in consultation, but the total number would, I feel sure, be a fairly large one. In the earlier years of my practice no one dreamed of interfering with a case of pelvic hæmatocele unless there was evidence of suppuration, and even more recently the number of cases in which I have abstained from operating has probably been at least equal to the number in which I have operated. But for my present purpose cases not operated upon were of no value. For exact pathological inquiry it is necessary to see and handle the parts; the evidence afforded by mere clinical examination, however carefully conducted, is insufficient. Further, I have only taken account of ordinary typical cases in which the hæmatocele was the most conspicuous lesion. Cases, for example, where a small effusion of blood was found in the pelvis during operations performed for other conditions, and where the extravasation was a mere incidental complication of the disease for which the operation was undertaken, have been excluded from the list. Taking, then, this series of twenty cases in which the source of the hæmorrhage was verified by operation I obtained the following very remarkable result: Every one of the twenty cases was associated with tubal gestation; but so far from finding the majority of the cases due to rupture I found that rupture had occurred in only one case out of the whole number. In eighteen of the twenty cases the hæmorrhage had taken place from the open mouth of the unruptured tube. In the remaining case a very curious condition of things existed. There was tubal pregnancy, but the immediate source of the hæmorrhage was not the pregnant tube. There was a broad ligament cyst on the opposite side of the pelvis. Into this cyst a profuse intracystic hæmorrhage had occurred, and as a consequence the cyst had undergone rupture, thus giving rise to the hæmatocele. The case was interesting as pointing to the occasional occurrence of accidental sources of hæmorrhage. The fact of the coexistence of a tubal pregnancy on the opposite side may have been a mere coincidence. On the other hand, it may be that the general vascular activity of the pelvis, associated with the pregnant condition, was a factor in

determining the hæmorrhage. This, however, is a matter rather of scientific curiosity than of practical interest. The point of real importance is that, so far as the evidence afforded by my own individual experience extends, the part played by rupture in the causation of pelvic hæmatocele is a very small one, much the more usual source being hæmorrhage from the mouth of the unruptured tube. In a note at the foot of the table I have mentioned two

TABLE I.—*Pelvic Hæmatocele; Source Verified by Operation.*

	Cases.
Free end of gravid Fallopian tube	18
Rupture of early tubal gestation	1
Rupture of hæmorrhagic cyst of broad ligament in a case of early tubal gestation	1
	20

Note.—Two cases of late operation (seven months and four months) should probably be added to Class I., but as the evidence was not absolutely conclusive they have been omitted.

cases in which operation was performed at comparatively long intervals after the occurrence of the hæmatocele. The blood had been almost entirely absorbed, and no pathological evidence of gestation was obtained—that is, no embryo or other portion of an ovum. But the clinical evidence was in favour of both being cases of tubal gestation, and as the Fallopian tubes were found in each case empty and unruptured, the probabilities are great that they were instances of complete tubal abortion at a very early stage of pregnancy.

Having obtained this somewhat surprising result from a consideration of all my available cases of pelvic hæmatocele, it seemed to me that it would be worth while to carry the investigation a little further. The result is given in the three following tables. In Table II. I have shown the condition found in each of the thirty-four cases of early tubal gestation operated upon in my own practice. With the cases

TABLE II.—*Cases of Early Tubal Gestation Operated Upon.*

	Cases.
Tubal mole, without rupture or hæmorrhage external to the tube	6
Tubal mole, with hæmorrhage from the free end of the tube	19
Rupture of the gravid tube...	9
	34

in the first series—the cases in which neither rupture nor (extra-tubal) hæmorrhage had occurred—I have at present no further concern. But the remaining two series of cases it is important to consider separately. Taking first the 19 cases of tubal mole, with hæmorrhage from the free end of the tube, it will be seen (Table III.) that a pelvic hæmatocele resulted in 17, whilst in the remaining two the blood was effused into the general peritoneal cavity.

TABLE III.—*Cases of Tubal Mole with Hæmorrhage from the Free End of the Tube.*

	Cases.
Pelvic hæmatocele resulted in	17
Free intra-peritoneal effusion	2
	19

In Table IV. the cases of rupture are subjected to a similar analysis, with the result that seven out of the nine are seen to have been accompanied with a free effusion of blood in the peritoneal cavity; in one case a pelvic hæmatocele was formed, and in the remaining case rupture had occurred extra-peritoneally, forming a hæmatoma of the broad ligament.

TABLE IV.—*Cases of Rupture.*

	Cases.
Free intra-peritoneal effusion in	7
Pelvic hæmatocele in	1
Hæmatoma of broad ligament in	1
	9

The one case of rupture that ended in the formation of hæmatocele is worthy of being given in brief detail. It was that of a married woman, aged thirty-seven years, who was admitted into St. Thomas's Hospital looking very weak and ill and presenting the ordinary physical signs of pelvic hæmatocele of considerable size. She had been confined with her fourth and last child five years previously. Her last menstrual period had ceased on Nov. 24th, 1891. From that time she had suffered more or less continuous pain. On Jan. 20th, 1892, she had been suddenly seized, whilst sitting quietly in the house, with a very violent pain in the right iliac region, which compelled her to go to bed. Two hours later she had a somewhat profuse hæmorrhage per vaginam. There had been two subsequent attacks of hæmorrhage, slighter in character, during the following month, and she had been in constant though less severe pain. She was admitted to the hospital on Feb. 23rd, 1892. The case was diagnosed as pelvic hæmatocele originating in a tubal gestation, and it was decided to watch it. On May 8th painful uterine contractions came on, and a decidual cast of the uterus, of considerable thickness and measuring two and a half inches by two inches, was expelled per vaginam. This, of course, placed the diagnosis beyond doubt. I still continued, however, to watch the case, being prepared to interfere at any moment if the necessity arose. When the patient had been in hospital a month it was found that the swelling had increased in size rather than diminished. I therefore determined to open the abdomen. This was accordingly done on March 21st, four months from the alleged date of the last menstruation, and two months from the date of the first attack of violent pain and hæmorrhage. A mass of dark, firm clot, eleven and a half ounces in weight, was found filling the pelvis, and in the midst of this mass was found a fœtus four inches in length, with cord, placenta, and membranes. The hæmatocele was roofed in by adherent omentum and intestine. After the pelvis had been cleared the dilated and ruptured right Fallopian tube was brought into view and removed. The rent in the tube was a large one and was situated on its posterior aspect. The patient, as almost all these patients do, made an uninterrupted recovery. The history in this case had misled me. The size of the fœtus made it evident that either the patient was mistaken as to her dates and was really eleven or twelve weeks—instead of only eight weeks—pregnant when the first symptoms of internal hæmorrhage occurred, or, what seems very unlikely, the fœtus had continued to live and grow for three or four weeks after the occurrence of the hæmorrhage. Had I known that the pregnancy had advanced so far I should have been sure there was rupture, and should not have waited in the vain hope of a spontaneous cure. The preparation is now in the museum of St. Thomas's Hospital.

I am quite aware that the number of cases on which this investigation is based is too small to furnish material for dogmatic statement. No one is more keenly aware than I am of the fallacies that are inseparable from hasty generalisations on insufficient data. I merely offer these figures as my personal contribution to the study of pelvic hæmatocele. Other observers both in this and in other countries are arriving at similar conclusions. In a recent discussion on pelvic hæmatocele in the Surgical Society of Paris more than one speaker expressed the opinion that insufficient attention had hitherto been given to the important part played by tubal abortion in the etiology of hæmatocele. Martin and Zedel in Germany, and Bland Sutton and John W. Taylor of Birmingham in our own country, have expressed similar views and published cases in support of them. It would in one sense have made this address more complete if I had included in it a *résumé* of recent literature on the subject and added the experience of others to that of my own. But I am disposed to think that not the least useful contributions to the advance of medical knowledge are sometimes to be found amongst those which are based entirely on the writer's own personal experience. A writer knows his own cases best; he knows best how to classify them; he knows which are available for comparison and which are not; and, what is of equal importance, he knows which cases ought to be excluded on the ground of the record being imperfect.

But enough of apology. My figures are before you to be taken for what they are worth. Most practitioners have met with cases in which the signs and symptoms have appeared fully to justify the diagnosis of pelvic hæmatocele, and in which under treatment by rest alone the swelling has entirely disappeared and the patient has recovered. Some have seen several such cases in the course of their experience. Men who are in the habit of reflecting on their cases must have been finding it difficult to reconcile these recoveries with the current teaching. If pelvic hæmatocele is almost invariably due to ruptured tubal pregnancy, how is it that so many cases took a favourable course without operative interference, and, indeed, without active intervention of any kind? The facts I have been permitted to place before you this evening smooth away this difficulty. It is, in my opinion, because pelvic hæmatocele is usually associated, not with rupture, but with hæmorrhage from the open mouth of the tube in a very early stage of tubal gestation that so many cases

recover without operation. The embryo is often of insignificant size and is easily absorbed. Along with the diminutive products of conception the effused blood also undergoes absorption. Have we, then, any guide as to when it is safe and when it is not safe to withhold operative influence? It can, I think, only be safe to do this when the clinical history points unmistakeably to the hæmorrhage having occurred within the early weeks of pregnancy. "At a later stage," as I have said elsewhere, "the embryo and other products of conception are too large, and the risk of further hæmorrhage is too considerable for non-operative treatment to be justifiable." Again, whenever the severity of the initial symptoms is sufficient to lead to a suspicion that the case is one of rupture I am of opinion that there should be no hesitation in advising operation. Even where this is not the case, and where the history and symptoms point to a different conclusion, the dimensions of the swelling should be carefully examined from day to day, and when the swelling is found to be increasing, or when, from the repeated occurrence of attacks of pain and faintness, there is reason to believe that hæmorrhage is still going on, then, too, I consider the indications for operation are imperative. I need scarcely add that where the hæmorrhage from a tubal gestation, whether due to rupture or not, is diffused in the peritoneal cavity, the necessity for immediate operation, if the condition of the patient permits it, is indisputable.

A word remains to be said of the rarer causes of pelvic hæmatocele. Whilst preparing this address I received from a Canadian professor of gynæcology, Dr. Wm. Gardner, of the McGill University, a paper containing a clinical record of two cases exemplifying the association of cancer and tuberculosis of the genital organs of women with pelvic hæmatocele. It was a curious coincidence, for they are the only cases of the kind I remember to have seen described. They were unique in Dr. Gardner's own experience, and must be of extreme rarity. A case of my own, included in the tables, shows that the rupture of a cyst into which profuse hæmorrhage has occurred may be occasionally the source of a hæmatocele.

I could also relate cases in which, during the operation for the removal of inflamed uterine appendages, I have unexpectedly opened up intra-peritoneal collections of altered blood, due no doubt to hæmorrhages occurring as accidental complications of the inflammatory process. These and other cases I could cite, from my own records and from those of others, show that there remain exceptional cases unassociated with ectopic gestation. At the same time it is abundantly clear that many of the causes of pelvic hæmatocele enumerated by the older writers are purely hypothetical and that most of the cases attributed to menstrual disturbances, bursting of apoplectic ovaries, rupture of veins, and so on, when read in the light of our present knowledge, are easily recognised as having been misunderstood cases of early tubal gestation.

A MEETING of Fellows of the Royal College of Surgeons of England was held at the Medical Institute, Birmingham, on Wednesday last in support of the candidature of Mr. Bennett May for a seat on the Council of the College. The following resolution was proposed and carried unanimously:—"That this meeting of Fellows of the Royal College of Surgeons desires to express its approval of the candidature of Mr. Bennett May for the seat on the Council vacant by the death of Mr. Oliver Pemberton, and pledges itself to his support."

FREEMASONRY: THE RAHERE LODGE No. 2546.—The Installation meeting of this lodge was held in the Great Hall at St. Bartholomew's Hospital on the 15th inst., W. Bro. Alfred Cooper, P.G.D., the W.M., in the chair. Messrs. Matthews, Miles, and Shewell were initiated into Freemasonry, and Messrs. Gell and Auden were proposed as members of the Lodge, whilst Bro. C. O'B. Harding was proposed as a joining member. Bro. Walsham was then installed by Bro. Trollope as the W.M. for the ensuing year. He appointed Bro. Burns and Bro. Reece as his principal officers and invested Bro. Gripper as treasurer of the lodge. The balance sheet was presented and adopted. It showed that the lodge had a substantial balance, though it had contributed freely to the various masonic charities. A past-master's jewel was presented to W. Bro. Alfred Cooper. The lodge was then closed, and the brethren with their guests betook themselves to Frascati's Restaurant, where they dined together to the number of seventy-three.

ABSTRACT OF

Lectures

ON

DISEASES OF THE GALL-BLADDER AND BILE-DUCTS.

Delivered at the Royal College of Surgeons of England on March 8th, 10th, and 12th, 1897,

BY A. W. MAYO ROBSON, F.R.C.S. ENG.,

HUNTERIAN PROFESSOR OF SURGERY AND PATHOLOGY, ROYAL COLLEGE OF SURGEONS OF ENGLAND.

LECTURE III.[1]

Delivered on March 12th.

Gall-stones or Cholelithiasis.—The importance of this subject may be gathered from the facts, that post-mortem records on persons of all ages and both sexes, prove gall-stones to be present in from 5 to 10 per cent. of all Europeans, in Strasburg the record being 12 per cent. (Schroeder), in Kiel 5 per cent., and in Manchester 4·4 per cent. (Brockbank). Time will not permit me to enter on the pathology of the subject, although it is of such great interest, nor can I discuss the causes, composition, sizes, numbers, or varieties of gall-stones or enter into the ordinary symptoms, complications, diagnosis, and medical treatment, all of which subjects I have recently written on in my article in Professor Clifford Allbutt's System of Medicine. I must therefore at once pass on to the consideration of the surgical treatment of cholelithiasis, a subject of great importance, which will, I think, well repay careful study. Permit me, first, to draw your attention to the list of cases on which I have operated and which will serve as a basis for my further remarks. An analysis of the table shows that out of 170 operations of all classes, including malignant cases, 10 patients died. Of the 93 patients without jaundice all recovered, all the deaths occurring among the 77 jaundiced cases. Of the 10 patients who died, only 4 were the subjects of gall-stones, and they had deep jaundice or infective cholangitis, or both, at the time of operation; the remaining 6 were for the most part the subjects of malignant or other fatal diseases. Out of 115 cholecystotomies there were 5 deaths, 3 being the subjects of cancer and 2 of suppurative cholangitis with jaundice; in other words, the mortality of cholecystotomy for gall-stones is only a little over 1 per cent. There were 7 cholecystectomies with 1 death, which is equivalent to a mortality of 14·28 per cent. That death was due to want of efficient drainage. Of the 26 cholelithotrities all recovered. Choledochotomy furnishes 6 cases in the list, out of which 1 patient died, as the result of an accidental laceration of the intestine in separating adhesions not noticed at the time of operation. The mortality equals 16·6 per cent. Of the 11 cholecystenterostomies one died; and as that patient was the subject of extensive malignant disease, the percentage mortality of the operation for gall-stones is therefore *nil*. Of the abdominal sections, 32 in number, 2 patients died from shock and hæmorrhage. These were among the 19 operated on for tumours or other serious organic disease; but out of the 11 operated on for separation of adhesions, 3 for intestinal obstruction and 1 for peritonitis, all recovered.

Surgical treatment—After medical treatment has been fairly and fully tried, and failed, I think all are now agreed that surgical measures should be resorted to. While cholecystotomy is generally recognised as the operation to be aimed at in the treatment of affections of the gall-bladder or bile-ducts, especially in cholelithiasis, it is often impossible to say what operation will have to be done until the abdomen is opened. The indications for operating would seem to me to be as follows:—1. In frequently recurring biliary colic without jaundice, with or without enlargement of the gall-bladder. 2. In enlargement of the gall-bladder without jaundice, even if unaccompanied by great pain. 3. In persistent jaundice ushered in by pain, and where recurring pains, with or without ague-like

[1] Lectures I. and II. were published in THE LANCET of May 29th and June 5th respectively

paroxysms, render it probable that the cause is gall-stones in the common duct. 4. In empyema of the gall-bladder. 5. In peritonitis, starting in the right hypochondrium. 6. In abscess around the gall-bladder or bile-ducts, whether in the liver, or under, or over it. 7. In some cases where, although gall-stones may have passed, adhesions remain and prove a source of pain and illness. 8. In fistula, mucous, muco-purulent, or biliary. 9. In certain cases of chronic jaundice, with distended gall-bladder dependent on some obstruction in the common duct, although the suspicion of malignancy be entertained. In such cases the increased risk must be borne in mind, as malignant disease may be the cause of the obstruction, and operation in such cases is attended with greater danger than ordinary. 10. In phlegmonous cholecystitis and in gangrene, if the case be seen and recognised at a sufficiently early stage of the disease. 11. In gunshot injury or in stab wounds over the region of the gall-bladder. 12. In suspected rupture of the gall-bladder without external wound. 13. In some cases of chronic catarrh of the gall-bladder or bile-ducts. 14. In suppurative cholangitis. Of the operative measures undertaken for diagnosis, sounding and aspiration of the gall-bladder must be referred to. The so-called "sounding for gall-stones," either by means of a probe passed through a cannula or by the fine needle of an aspirator, is both uncertain and dangerous, and may more safely be replaced by a small exploratory incision, which can be extended for treatment if required. Aspiration of a distended gall-bladder through the unopened abdomen, though apparently a simple procedure, is not unattended with danger, death having followed in more than one instance. Murphy says it is fatal in 25 per cent. It is only in very exceptional cases that it can do any good. Here, again, I infinitely prefer to make a small exploratory incision, then to empty the gall-bladder by the aspirator, and afterwards to explore the bile passages with the fingers. If, however, aspiration without exploration be decided on, a small needle should be used and the cyst emptied as far as possible, in order that intra-cystic tension may not lead to extravasation through the needle puncture. Since in the majority of cases an operation for gall-stones is, in the first place, simply exploratory, the actual operation on the gall-bladder or bile-ducts being only determined by the conditions found when the abdomen is opened, it may be well for us first to consider a simple abdominal section in the gall-bladder region.

Position of the patient.—It has been proposed to suspend the upper part of the trunk when the patient is on the operating table by straps placed under the armpits, in order to allow the intestines to fall away from the liver, and thus to afford a better view of the parts to be operated on, just as the Trendelenberg position does in the case of the pelvic organs; but as this is inconvenient, and, as a rule, impracticable, it is worth considering whether we can in any way modify it. I think it will be found that a narrow, firm sand bag covered with flannel placed at the liver level on the operating table under the back, which is thus arched over it, will do all that is required, as it brings the common duct from two to three inches nearer the surface, opens out the costal angle, and tends to make the intestines slip down from the liver. I have never seen or heard of this method having been made use of by others, but as I have employed it on many occasions I can speak well of its utility.

Incision.—A vertical incision in the right semilunar line is the one most frequently resorted to, and is the one I prefer. If there be a perceptible tumour, it is well to make the incision over the most prominent part; if there be no tumour, but an enlarged liver, the upper end of the incision will have to commence at the hepatic margin. If, however, as is so often the case, there be neither tumour nor enlargement of the liver, the incision will be from the ninth costal cartilage vertically downward for three inches. As a rule the aponeurosis in the semilunar line is divided; but if the rectus be wide, its fibres may be separated, and the anterior and posterior layers of the rectus sheath will then be separately cut. If more room be required it can be obtained either by extending the vertical incision or adding a transverse one, either internal or external to the vertical line, in whichever direction it may seem advisable. It is advisable to avoid as much as possible dividing muscular fibres, as they retract, and can only with difficulty be approximated in suturing the wound. The transversalis fascia and peritoneum are best divided together, without separating them, as together they form a strong membrane, whereas singly they are too weak to hold stitches if there be tension. Kocher employs an oblique incision parallel to the right costal margin, which of necessity divides muscle, but which exposes the parts freely, as the wound at once gapes widely, although for cholecystotomy the transverse incision is quite unnecessary and to my mind usually inadvisable. Where it is necessary to expose or manipulate the common duct it presents the advantages of better exposure and more efficient drainage. The lumbar incision, which has been suggested in order to reach the common duct without opening the peritoneum, is quite impracticable.

Arrest of hæmorrhage.—As a rule pressure forceps and an occasional ligature effect all that is desirable or necessary, but in cases of long-standing jaundice, especially if accompanied by malignant disease, additional precautions are advisable on account of the tendency to hæmorrhage. In order to avert this danger in deeply jaundiced patients I have found the administration of chloride of calcium in 30-grain doses every four hours for a few days before the operation useful in making the blood more plastic and in lessening the tendency to bleeding, both at the time of operation and subsequently. For this therapeutic measure I am indebted to Dr. A. E. Wright, whose researches on the "Coagulability of the Blood"[2] are well worthy of study. After operation, the drug may be continued either by the mouth or by nutrient enema for some time with advantage. In order to remove the danger of ventral hernia I suture the abdominal wall, layer by layer; but if the operations have been very prolonged, and the patient be suffering from shock, it may be advisable to suture the parietes *en masse*. Where it is considered wise to employ gauze packing it is well to apply the sutures and to leave them long, so as to be able to draw the edges of the wound together after the tampon has been removed, without putting the patient to the inconvenience of inserting stitches later. The preliminary preparation and the after treatment of these cases differ in no respect from that of abdominal section in general. Cholecystotomy or cholecystostomy usually follows on exploration, as it is unquestionably the operation *par excellence* in the treatment of gall-stones. The indications for the operation are:—1. In all cases where the gall-bladder is sufficiently large to permit of drainage, after gall-stones have been removed from the gall-bladder or ducts. 2. In cases where there are gall-stones in the ducts, but the patient is too ill to bear a prolonged operation, the gall-stones being deliberately left for treatment by some solvent solution. 3. In empyema of the gall-bladder where that viscus is not too much disorganised to be permitted to remain. 4. In certain cases of chronic catarrh of the gall-bladder or bile-ducts. 5. In suppurative cholangitis. 6. In obstruction of the ducts due to hydatid disease. 7. In dropsy of the gall-bladder. 8. In idiopathic rupture, or laceration, or gun-shot injury of the gall-bladder or ducts. 9. In cases of choledochotomy in order to avoid tension in the sutured duct. 10. In certain cases of obstructive jaundice dependent on malignant tumour, which is occluding the ducts; but in these cases the increased danger must be borne in mind. 11. In some case of phlegmonous cholecystitis or gangrene, where the patient is too ill to bear cholecystectomy.

Technique.—If the gall-bladder be found distended it is aspirated and then opened, the parts being isolated by thin, flat sponges. If, as is so often the case, the gall-bladder be small and atrophied, it will probably be surrounded by adhesions which require careful separation, which can for the most part be better done by touch than sight. If the operation has been undertaken for gall-stones they are removed by means of forceps passed through the opening in the gall-bladder, or, better still, by the scoop which I now show. If they be small they are removed whole; if large they may be directly needled or crushed and removed in fragments. After the gall-bladder has been cleared the fingers of the right hand are passed along the outside of the ducts, when if there be any other concretions they can as a rule be felt, and if possible they should be manipulated backward into the gall-bladder, from which they can be removed. If this be impracticable, without undue force, cholelithotripsy or choledochotomy may be necessary, which operations I shall consider later. Supposing the bile passages to have been cleared, or for some reason further manipulations are considered advisable, a non-perforated rubber drainage tube is inserted into the gall-bladder, and the edges of the incision in it are brought up

[2] Brit. Med. Jour., Dec. 19th, 1891.

and sutured by fine chromic catgut to the aponeurotic layer of the abdominal wall, not to the skin, thus avoiding the danger of fistula, as between the opening in the gall-bladder and the skin is a considerable thickness of tissue, which soon becomes covered with granulations, and their contraction in healing secures closure. Since adopting this method I have never had a fistula follow cholecystotomy if the ducts have been cleared. Where there is time, I prefer to suture the peritoneum of the gall-bladder to the parietal peritoneum, and the mucous margin to the aponeurosis, thus more completely shutting out the peritoneal cavity. The remainder of the parietal incision is closed as described under simple exploratory incision. In ordinary simple cases, the drainage tube is shortened on the second and third day, and removed on the fourth or fifth; but if there have been much cholecystitis, or cholangitis it is better to drain for a week or even longer. Dr. Terrier, in operating for suppurative cholangitis, suggests that the discharge should be bacteriologically tested from time to time, and that the tube should not be removed until the bile is sterile or nearly so, for at first it is loaded with organisms, and if all goes well these diminish and finally disappear. The tube may be either cut off close to the surface or may be brought through the dressings into a receptacle placed by the side of the patient; the latter method saves frequent dressings, which are otherwise necessary when the discharge is free. This description applies to the ordinary operation on a gall-bladder of ordinary size, or to one distended; but in the case of a contracted gall-bladder situated deeply the operation may be both prolonged and difficult. Where I have been unable to bring up the gall-bladder I have at times succeeded in tucking down the parietal peritoneum to the edges of the gall-bladder opening, and so effecting suture of the contiguous margins; but in several cases where I could not effect this I have with complete success utilised the right border of the omentum, by suturing it to the margin of the gall-bladder opening and to the parietal peritoneum, thus forming a tube of peritoneum around the drainage-tube and shutting out the general peritoneal cavity. This method has also since been efficiently employed by Mr. Arthur Barker. Where occlusion in this way cannot be effected, the insertion of a drainage-tube into the gall-bladder without suture of the margins to the parietes seems to be efficient, for it is, on account of intra-abdominal tension, easier for the bile to pass away directly through the tube than to enter the abdomen, and it is probable that within from 24 to 48 hours plastic peritonitis shuts out the drainage-track from the general peritoneal cavity. The method of packing around the tube with iodoform gauze in such cases is one in which I have great faith, as I have found it to be a safe means of occluding the peritoneal cavity. Mr. Knowsley Thornton suggested supra-pubic drainage in cases where occlusion of the bile channels is doubtful, but if I require to drain the abdominal cavity in such cases I prefer to do it either by means of a tube passed into the right kidney pouch and brought out at the lower end of the original incision, or through a stab puncture in the right loin. Dr. Murphy has invented a "button tube" (which I now pass round) for use in cases where the gall-bladder is contracted and cannot be brought to the surface, but in practice I have found that the contracted gall-bladder is as a rule too small to permit of its employment, and though I have taken it with me regularly to a number of operations I have never yet met with a case where I thought it desirable to employ it. In certain cases where the gall-bladder is contracted, after opening and clearing it and the ducts, the incision may be immediately closed by suture, the line of incision being isolated by a gauze drain; or in other cases cholecystectomy may be performed and the cystic duct ligatured, the gauze drain being again employed; or, as suggested by Mr. Morison, the incision in the gall-bladder may be deliberately left patent and the bile allowed to run into the right kidney pouch, from which it is removed by a drainage tube in the loin. The operation of cholecystotomy has been modified in several ways; for instance, the opening has been closed and then fixed to the abdominal incision, which has been closed over it; this operation is known as cholecystendysis (Courvoisier). It can only be of use where the ducts are known to be thoroughly cleared, where there is no fear of subsequent stricture, and where there is no catarrh or inflammation of the bladder or bile passages. The so-called "ideal" operation suggested by Langenbach,[3] in which the opening in the gall-bladder is sutured and the viscus returned without fixing it to the surface, has been thought by Lange, Meredith, Kuster, Keen, and others to be attended with greater risk than the operation of cholecystostomy. If it be thought advisable to adopt this method, it is necessary to prove that the ducts are clear, and this may be accomplished by distending the gall-bladder with warm sterilised water and then forcing it through the ducts, or by catheterism of the ducts, as advocated by Terrier and Dalby.[4] I have employed both methods, but prefer the former, both on account of its safety and efficiency. Recently reported cases of "ideal" cholecystostomy would seem to prove that the dangers at first attending the operation may be overcome by a proper selection of cases and by carefully suturing the mucous, muscular and serous margins separately; but I think the serious objection to it is that the benefits of drainage are not obtained, as in the operation of cholecystostomy. A real use for this modification is found in cases where it has been necessary to open a contracted gall-bladder, but where, on account of the depth, it is found impracticable to bring it to the surface; as also when, from the contraction of its cavity, it is found impossible to insert a drainage tube. Under such circumstances sutures can readily be applied by means of a rectangular cleft palate needle or by Lane's needle-holder. The line of suture is made secure against dangerous leakage by the gauze drain, the lower end of which is packed moderately firmly over the gall-bladder. Another modification, suggested by Bloch, is that in two stages. The operation consists in incising the parietes until the peritoneum is reached, the cavity of which, however, is not opened; the wound is then packed with gauze and left for several days, when adhesions will have formed between the gall-bladder and the parietal peritoneum. The gall-bladder can then be safely opened. Or if the peritoneum be opened, the gall-bladder is fixed, but not opened until adhesions have formed. As the method is only available for the simplest cases—viz., where the gall-bladder is distended—as it does away with all chance of exploring the ducts by the hand within the abdomen, and as it is frequently followed by fistula, I would only mention it to condemn it as clumsy and uncertain and no safer than the ordinary operation of cholecystotomy. In this opinion I would make one exception, I think the operation "à deux temps" presents considerable advantages when cholecystotomy is being undertaken in the presence of chronic jaundice associated with distended gall-bladder, as in such cases there is usually malignant disease either of the head of the pancreas or of the bile-ducts, and when the peritoneum is exposed, but not opened, pressure can be applied to arrest the oozing of blood, which cannot always be stopped by ligatures or forceps. Bloch, however, in his original papers and in his latest in the *Revue de Chirurgie* for 1895, does not recommend the operation for this reason, but on account of the fear of septic contamination of the peritoneum, which ample experience proves to be groundless. The statistics of cholecystotomy vary very considerably in different hands. As in ovariotomy, experience leads to greater success, and those who have done a considerable number of operations will as a rule show the best results. Out of 115 cholecystotomies which I have performed there were five deaths, three being the subjects of cancer and two of infective cholangitis with jaundice. In other words, the mortality from cholecystotomy for gall-stones is only a little over 1 per cent., or, including malignant cases, 4·34 per cent. Murphy, at the Roman Congress, collected 201 cases of cholecystostomy, the mortality being 19 per cent. Mr. Page (Newcastle) has been so kind as to furnish me with the result of operation at the Newcastle Infirmary, where out of twenty-four operations six died. Mr. Charters Symonds has performed eight operations, with recovery in all. With regard to recurrence, if the ducts be cleared and the gall-bladder drained recurrence is rare. Kehr says of his cases that there has been no recurrence.

Fistula following cholecystotomy.—An eminent operator recently told me that he thought fistula frequently followed on cholecystotomy. I suppose he was arguing from his own experience, which, however, is quite at variance with mine, since I have adopted the modification of suturing the edge of the gall-bladder incision to the aponeurosis and not to the skin, for it distinctly proves that fistula will only follow under such circumstances if the

[3] Centralblatt für Chirurgie, 1887.

[4] Revue de Chirurgie.

ducts have not been cleared, and then it is better that there should be such a safety valve, which can be remedied by a further operation. In my first ten cases I had five fistulæ; these were all operated on by stitching the gall-bladder to the skin. In my later 160 cases there were only seven fistulæ, all of which were cured by further clearing the ducts or short-circuiting the obstruction. As one would expect, cholecystotomy "à deux temps" is often followed by fistulæ. Martig gives 20 per cent. and Courvoisier 34 per cent., which, of course, are due to imperfect clearing of the ducts. After cholecystotomy has been performed and the gall-bladder cleared of its contents it may be found impracticable to remove other gall-stones impacted in the cystic or common ducts, either by means of forceps or scoop introduced through the gall-bladder incision, or by digital manipulation from without. Under such circumstances the gall-stones may be crushed or removed by "choledochotomy," or under certain circumstances "cholecystenterostomy" may be performed. As crushing is the least severe procedure, and as I have had considerable and favourable experience of it, I will describe that operation first.

Calculi in the common bile-duct.—Before proceeding to a description of cholelithotrity or choledochotomy it may be advisable to refer to the special condition of cholelithiasis, where the gall-stones are in the common duct, which, according to Courvoisier, occurs in about 4 per cent. of all cases. A reference to the cases that have come under my care shows this to be an under-estimate, as I find that out of 170 cases on which I have operated there were gall-stones in the common bile-duct on 28 occasions, which equals 20 per cent. My experience shows a much larger proportion of multiple calculi in the common duct. In my paper read before the Clinical Society of London in 1888, and again on page 82 of my work on Gall-stones published in 1892, I drew attention to contraction of the gall-bladder as an important diagnostic point, and this has been borne out by other observers independently. I then remarked that jaundice with distended gall-bladder was presumptive evidence in favour of malignant disease, but that jaundice without distended gall-bladder favoured the diagnosis of cholelithiasis. Of thirty-five operations for obstruction in the common duct, Courvoisier found that eighteen were due to causes unconnected with gall-stones, such as cancer, stricture, or tumour; of these, the gall-bladder was dilated in sixteen, whereas only seventeen were dependent on gall-stones and of these seventeen the gall-bladder was atrophied in thirteen. I think the explanation is to be found in a combination of causes: (1) All cases of cholelithiasis are accompanied by inflammation of the walls of the biliary passages, as shown by the almost universal presence of adhesions around the gall-bladder; (2) gall-stones in the common duct seldom cause complete obstruction, either because they are floating in the duct or because they only partially fill it, there is, therefore, no sufficient backward pressure to cause dilatation of the gall-bladder; (3) the muscular coat of the gall-bladder, though feeble, is sufficient to enable it to contract, which it doubtless does in efforts of expulsion when there is any obstruction in the common duct; and (4) the contraction, from being at first intermittent, becomes in the long run constant, and the accompanying inflammation fixing the contracted gall-bladder, it atrophies. The special symptoms pointing to stone in the common duct are absence of enlargement of the gall-bladder, with frequent mild attacks of pain, followed by an intensification of the jaundice, which in many cases never quite disappears. The seizures are often associated with intermittent feverish attacks and loss of weight. The pain is in the epigastric rather than in the right hypochondriac region, and passes through to the right dorsal or lumbar, rather than to the right infra-scapular, region. Where jaundice is continuous and intense without much variation, especially if the gall-bladder be enlarged, there is usually malignant disease or some other cause than gall-stones. All the other symptoms characteristic of gall-stones may have been present for some time previously or may coexist with those above mentioned.

Methods of Treatment.—The treatment of calculous obstruction in the common duct is of the utmost interest, both on account of the difficulties to be overcome and of the great importance to the patient, who in the greater number of cases is otherwise condemned to a lingering and painful illness, often ending in death. 1. In a few cases a concretion of moderate size may be manipulated backwards into the cystic duct, and thence extracted by scoop or forceps; but it is seldom practicable on account of the contraction of the gall-bladder and cystic duct. 2. Occasionally a small stone may be pressed into the duodenum, but this is rare, and not infrequently it may be pushed into a dilated diverticulum of Vater, and so be missed, and the whole operation rendered futile. 3. Cholecystostomy, with subsequent treatment by solvent injections, is well worth bearing in mind, on account of its simplicity and safety, together with the certainty of giving immediate relief with a modicum of risk, and putting the patient in better condition for subsequent treatment, should such be necessary. 4. Cholelithotrity, or crushing the stones *in situ*. 5. Needling concretions through the duct walls. 6. Choledochotomy, or incising the duct and removing the calculi. 7. Choledocho-duodenotomy, or reaching the duct through the opened duodenum, for stones impacted in the duodenal end of the duct. 8. Cholecystenterostomy, or short-circuiting the obstruction. 9. Choledochenterostomy, or uniting the duct to the gut in case of largely dilated ducts. 10. Choledochostomy, or attaching the dilated duct to the surface and draining it. It will thus be seen that the surgeon has a great variety of operations to choose from, and he will act the wisest, who, knowing all, is able to choose that peculiarly adapted to the case in hand. The various operative procedures I propose to consider in detail. Cholelithotrity was first suggested and put in practice by Mr. Lawson Tait, and has since been extensively and most successfully employed by him, by myself, and others. The ordinary incision for cholecystotomy may be large enough, but if the patient be stout, or the ducts cannot easily be reached, it may have to be increased so as to allow the hand to pass into the peritoneal cavity, in order that the fingers may locate and grasp the stone *in situ*. If the right hand be used the thumb will enter the foramen of Winslow and the index finger will pass in front of the common duct, or in case of the left hand being used these digits will be reversed, when the whole force of the opposing finger and thumb can be brought to bear on the concretion. I have found by experiment that this force amounts in my own hands to ten kilogrammes without support to the fingers, and thirteen when the fingers are supported. Usually the gall-stone flattens out into a wafer shape, and in altering the position of the digits the edges of the wafer are compressed and the concretion is either converted into pulp or breaks into innumerable fragments, which can be passed on towards the duodenum or subsequently washed through. I have performed this operation twenty-seven times and have had no subsequent trouble on account of damage to the ducts. In some cases of stones in the common duct the concretions have been too hard to crush, and I have had to perform choledochotomy. The disadvantages of cholelithotrity are (1) the fear of seriously damaging the ducts by the manipulation; and (2) the danger of leaving fragments permanently in the passages, which may then grow by further deposit of cholesterine. I have shown by my cases that the first danger need not be feared if the finger and thumb only be used as the compressing force, but I think it might be real if attempts were made to crush hard stones by instrumental means, although I did employ padded forceps to some of my earlier cases. The question of needling impacted concretions by the passage of a needle through the walls of the duct was raised by my colleague, Mr. Teale, in 1895. In my work on Gall-stones published in 1892 (p. 144) I referred to the subject, and Mr. Knowsley Thornton has employed it. It was also fully discussed after a paper I read at one of the societies, and I think it was almost unanimously decided that, although concretions might be broken up by needling, the operation was inadvisable on account of the almost unavoidable damage to the ducts and the fear of infection. It may, however, be borne in mind that some of the very hard stones may be broken up by means of a needle, and that the fragments may be further crushed between the finger and thumb. The second danger—of leaving fragments in the ducts—may be overcome by at the same time performing cholecystotomy and later syringing the ducts with sterilised water until they are clear of débris, or, if any fragments should be unavoidably left, by applying through the fistula some solvent solution. In one case, after cholecystotomy with crushing of calculi in the common duct the fragments did not pass until I injected a few drops of a solution of turpentine in ether into the fistula. Great pain followed, the duct became patent, and the fistula closed, the patient having

remained well since. The result in this case was probably rather due to the contractions set up in the duct than to the solvent action of the remedy used, and I cannot, on account of the severe pain set up for some hours, recommend its employment, though in this case the result was good. A more efficient method, which I now employ whenever I have reason to think that any of the fragments remain in the ducts, or wherever I have deliberately left a gall-stone which I could not crush and did not think it wise to remove by choledochotomy, is to syringe a warm 0·5 per cent. solution of sapo animalis or warm olive oil through the fistula night and morning until the passages are quite free. The olive oil and soap solution probably act in a double capacity as solvents and as lubricants. Dr. Brockbank found that a gall-stone placed in a 0·5 per cent. solution of sapo animalis in distilled water, and kept at the body heat in an incubator, lost 34 per cent. of its original weight in three weeks, and that a similar concretion in a 0·1 per cent. solution lost 14 per cent. of its weight in the same time.

Choledochotomy or choledocholithotomy is the name given to the operation of incising the bile-ducts for the extraction of gall-stones in cases where the concretions cannot otherwise be removed. It was probably first suggested by Langenbach in 1884, though Kummell (quoted by Fenger) stated in 1890, that he, several years before, had performed cholecystectomy on a female patient aged forty years, after which he had removed a stone the size of a walnut from the common duct through an incision which he afterwards sutured. The operation was a very prolonged one, and the woman died twenty-four hours afterwards. Courvoisier performed the first successful operation on Jan. 22nd, 1890, and two others, both successful, in February and March of the same year. It has since been performed by Langenbach, Thornton, Fenger, Greig Smith, Page, Terrier, Symonds, myself, and others. The cholecystotomy incision must be extended to four or five inches, and after the separation of adhesions the wound must be held open by a retractor on the right and preferably by an assistant's finger on the left, as the fingers can at the same time retract the pylorus and stomach on the left, and the colon and omentum below without inflicting injury, as retractors are apt to do. The assistant who is using the retractor on the right may with advantage use his left hand to draw upwards the overhanging liver and costal margin. The operator should now, after having separated adhesions, have a good view of the common duct within the free border of the lesser omentum, and on inserting his left index finger into the foramen of Winslow, or on grasping the duct between the index finger and thumb, he can without difficulty bring the duct well within reach, the concretion making a distinct projection. Over the prominent stone a vertical incision as low down and as far forward as possible should be made sufficiently large to allow the concretion to pass. Through this opening a probe can be passed, or even a finger, in order to explore the ducts thoroughly, so as to remove other stones if present. The incision in the duct may now be closed by interrupted sutures in two layers, first the muscular and fibrous coats being approximated, and secondly the serous margins; but if this be impracticable the muscular and serous coats may be sutured together and additional Lembert's sutures may be applied over all. I have found a rectangular cleft palate needle the most convenient instrument to employ in applying these deep sutures, though doubtless a small circular intestinal needle and holder will answer equally well, or the special needles and holder suggested by Mr. Lane may be found more convenient. If a gall-stone be felt in the hepatic duct it may be reached by opening the common duct and passing a scoop or forceps through this opening. Fenger has in this way explored the ducts and removed stones quite in the liver substance, and I have passed a long bent probe in this way quite into the primary division of the bile-ducts. Dr. Elliott recommends the application of the sutures before removing the stone. This is certainly an advantage, though if the ducts have to be explored afterwards the sutures are rather in the way. I think the same advantages may be obtained by introducing the two end stitches before extracting the calculus, as when they are drawn on the edges are approximated and more easily sutured. A large drainage-tube should be left in the abdomen, and it may be wise to pack gently iodoform gauze over the duct and to bring the end out by the side of the drainage-tube, if there be any doubt about the closure of the wound in the duct. The tube may be removed in twenty-four or forty-eight hours if there be only a little discharge, and the gauze should be gradually removed day by day until it is all away. Drainage through a stab wound in the right loin is an efficient means of draining the discharge from a leaking gall-bladder or bile-duct. Mr. Frederick Page, on the other hand,[5] advocates careful suture of the opening in the duct and closing the abdomen without leaving in a drainage-tube. Mr Greig Smith says that drainage is always advisable, and in this view I fully agree, as although in several of my cases there has been little or no discharge from the drainage-tube, in others the bile-stained discharge for a few days has proved that the closure of the opening was not perfect, and it must be borne in mind that although the ducts appear to be clear it is impossible to be absolutely certain, as was proved in one of my cases, where, under the supposition that I had effectually cleared the common duct, I removed a shrivelled and mutilated gall-bladder and ligatured the cystic duct, with the result that septic bile became extravasated into the peritoneal cavity and led to my only death from cholecystectomy. A small gall-stone was found obstructing the orifice of the duct where it was opening into the duodenum. The same difficulty was experienced in one of Fenger's cases and in several of Kehr's.

Choledocho duodenostomy is a term applied to the modification of the operation of choledochotomy, where a gall-stone is impacted in, and removed from, the diverticulum of Vater through an incision in the duodenum. McBurney,[6] Pozzi, and Kocher[7] have performed this operation with success. The operation is difficult and should only be done where the gall-stone cannot be brought into the more accessible part of the common duct.

Statistics of Choledochotomy.—As this is perhaps the most difficult and prolonged of the operations on the bile-ducts, the mortality is necessarily greater than that of simple cholecystotomy. In 1892 Martig had collected 27 cases, and in 1895 Mermann 17 others, giving a total of 44 cases, with a mortality of 18 per cent. Terrier, in 1892, had collected 20 cases, with a mortality of 25 per cent.[8] Hans Kehr,[9] collected from various sources 84 cases of choledochotomy, with 31 deaths (=37·8 per cent.). Even excluding severe cases the mortality was 25 per cent, though in his own practice the death-rate was only 6·6 per cent. He remarks: "The operation involves many difficulties which can only be overcome by one performing a large number of operations, and even then it is not very easy to remove all the concretions." Out of 30 cases, in 5 all the stones were not removed; in 3 the operation was repeated; and in 2 cases the wound reopened and gave exit to the calculi that had been left. Fenger has reported 5 cases, of which 1 died (=20 per cent.). Murphy 5 cases, of which 2 died (=40 per cent.). My own cases are 6 in number, out of which I have lost one, due to the accident of a slight laceration of the colon in separating adhesions (=16·6 per cent.).

Cholecystectomy, or excision of the gall-bladder, may be required in (1) bullet wound or other wound of the gall-bladder where suture is impracticable; (2) in phlegmonous cholecystitis; (3) in gangrene of the gall-bladder; (4) in multiple or in perforating ulcers; (5) in chronic cholecystitis from gall-stones, where the gall-bladder is shrunken and too small to drain safely and where the common duct is free from obstruction; (6) in mucous fistula due to stricture of the cystic duct; (7) in hydrops of the gall-bladder due to stricture of the cystic duct, as also in certain cases where the gall-bladder is very much dilated; (8) in certain cases of empyema where the walls of the gall-bladder are very seriously damaged; and (9) in cancer of the gall-bladder. It is contra-indicated in all cases of non-patency of the common duct, and it should not be resorted to under the idea that it will prevent the formation of gall-stones, as calculi may form in the bile-ducts within the liver or below it. The operation is performed through the usual incision for reaching the gall-bladder. The peritoneum covering the gall-bladder just below the liver is incised parallel to the hepatic margin, and the gall-bladder is freed by means of a finger or a blunt dissector as far back as the cystic duct, the latter part of the dissection being done sub-peritoneally as much as possible. The duct is ligatured and divided, the stump being asepticised either by the cautery or by the application of a 1 in 500 solution of perchloride of mercury. The peritoneum is now sutured over the top of the duct. There is

[5] THE LANCET, Dec. 5th, 1896.
[6] Annals of Surgery, Oct. 18th, 1893.
[7] Correspondenzblatt für Schweizerische Aerzte, 1897, No. 7.
[8] Brit. Med. Jour., Supplement, Jan. 7th, 1893.
[9] Berliner Klinische Wochenschrift, June, 1896

usually little bleeding, and that is easily arrested by sponge pressure or by one or two ligatures. Unless there be oozing, or unless the wound has been infected by pus or gall-bladder secretion, drainage may perhaps be thought unnecessary; but the adage, "when in doubt drain," is a good one, and it can do no harm to leave an efficient drainage-tube in the right kidney pouch for twenty-four or forty-eight hours after extirpation of the gall-bladder. Packing with iodoform gauze in these cases is better than using a tube, as it serves the double purpose of arresting oozing from the lacerated liver and acting as a drain.

Statistics.—Mortig has collected 87 cases of cholecystectomy with 12 deaths and 3 indirect deaths,[10] thus giving a mortality of 17·24 per cent; Kehr 21 cases with 1 death, equal to 5 per cent.; and Murphy gives the mortality up to 93 as being 17 per cent. I have performed the operation seven times with 1 death, giving a mortality of 14·28 per cent.

Cholecystenterostomy consists in establishing an artificial opening between the gall-bladder and intestine, duodenum, jejunum, or colon, preferably the first, when it may be termed cholecystduodenostomy. Although the conception of the operation occurred independently to Harley, Gaston, and Nussbaum, the first operation was actually performed by Winiwarter of Liege in 1880, and my own case in 1889 was the first of the kind performed in England, and the first anywhere for biliary fistula. In its place it is an extremely useful operation, but as it leaves the cause of the obstruction unremedied it ought not to be resorted to except occasionally, where a more radical operation is impracticable or inadvisable. Dr. Murphy, of Chicago, favours the procedure before other methods.

My conclusions are, that the operation is indicated:—1. In biliary fistulæ, depending on stricture or other permanent occlusion of the common duct. 2. Very occasionally in cancer of the head of the pancreas or malignant tumour of the common duct leading to chronic jaundice and distended gall-bladder; but in such cases the mortality will necessarily be so high that the justifiability of the operation is questionable. 3. Occasionally in impaction of gall-stones in the ducts, where the patient is not in a fit condition to bear the more prolonged operation of separating adhesions, and crushing or removing the concretion by choledochotomy. 4. In certain cases of obstruction of the cystic duct where cholecystectomy is impracticable.

Contra indications.—1. In any obstruction of the bile-ducts which can be cleared away with reasonable probability of success. 2. In malignant disease of the head of the pancreas or common bile-duct leading to distension of the gall-bladder the mortality is so great (eight operations with seven deaths) that it is hardly worth doing. 3. In contracted gall-bladder, where it is impracticable to insert the button. 4. Where there are extensive adhesions which would lead to kinking of bowel. 5. In very large gall-bladder with obstruction of the cystic duct, where cholecystectomy should be done. The operation may be performed: (*a*) by means of simple suture; (*b*) by means of my decalcified bone bobbin; and (*c*) by means of Murphy's button. My first case, in 1889, was performed by suture, my second and third cases by means of the decalcified bone bobbins, and in all my later cases I have used the Murphy button. Although all the cases when the operation was unassociated with cancer recovered, I decidedly prefer to make the union by means of the Murphy button, both on account of its efficiency and the expedition with which it can be used. The operation of cholecystenterostomy is performed through the same incision as is made for cholecystotomy, and after the gall-bladder has been aspirated and the intestine clamped either by an indiarubber tourniquet or by intestinal clamps the junction is effected. If sutures be employed, a semicircle of interrupted silk stitches is inserted to unite the contiguous serous surfaces of the gall-bladder and gut, the viscera are then opened, and the mucous margins of the two openings are united by interrupted catgut stitches, after which the circle of catgut stitches and then the circle of serous sutures is completed. If the bone bobbin be used, two continuous sutures only are employed, a silk stitch to unite the serous surface one-third or one-half of an inch from the visceral openings, and a catgut suture to join the mucous margins of the visceral openings. For convenience, the posterior semi-circle of the serous suture is first applied and the needle laid aside for a moment, but not unthreaded; the openings are then made and the posterior half of the mucous suture is inserted; the bobbin is then introduced and the mucous suture continued around until it meets the other end of the catgut, when the two ends are tied and cut off short; the serous suture is then carried around the anterior half until it reaches the point where it began, when the two ends are drawn on and tied. The bobbin keeps open the lumen until it is dissolved, and the mucous and serous sutures effectually protect the channel from leakage. If the Murphy button be used, the smallest size is selected and two running sutures are applied. After the gall-bladder has been emptied and the bowel clamped the openings are made in the viscera just sufficiently large to admit the separate ends of the button. The threads are then drawn on and tied around the central barrel of the button, after which the two ends of the button are approximated and pushed home firmly. The anastomosis is then complete. The whole process occupies a very short time and is really very simple; it is, however, necessary to bear in mind that the button has to separate by causing the approximated margins of the openings to slough, and that the true bond of union is only slight at first, so that it is well to keep the patient absolutely quiet for at least a fortnight, lest the new bond of union should give way and permit extravasation of the visceral contents. In considering the question of cholecystenterostomy, it has to be borne in mind that the operation can only be done when the gall-bladder is of moderate size or dilated, and that it is inapplicable to the difficult class of cases where a gall-stone is impacted in the common duct and the gall-bladder is atrophied. When it can be done, the anastomosis should be made to the duodenum, but if preferred a free loop of jejunum may be selected and brought over the hepatic flexure of the colon. In only exceptional cases should the anastomosis be made between the gall-bladder and colon. From a report up-to-date which Dr. Murphy has been so kind as to furnish me, cholecystduodenostomy has been performed with the aid of the anastomosis button in sixty-seven non-malignant cases with only three deaths, these being due to continuous hæmorrhage from laceration of the liver substance on the seventh day, to cholæmia on the fourth day, and to septicæmia on the fourth day, respectively. Of his twelve malignant cases ten died, giving a mortality of 83·3 per cent. My own cases are eleven in number, with one death, and that in a case of malignant disease with long-continued jaundice; my percentage mortality for cholecystenterostomy for gall-stones is therefore *nil*.

Choledochostomy is the term applied to the direct surface drainage of a dilated bile-duct. Terrier has described four cases;[11] I heard of a fifth from Dr. Arnison, of Newcastle, and found a sixth in the Museum of Guy's Hospital, all ending fatally within a few days or weeks of operation, owing to associated choledochitis and infection of the bile channels in the liver itself. In July, 1896, I performed choledochostomy in a man aged twenty-five years, after crushing a gall-stone the size of a small hen's egg, situated at the junction of the cystic and common ducts; the gall-bladder was much smaller than the duct, and I found it easier to fix and drain the duct. The patient made a good recovery (Case 150 on my list). Where it is impossible to clear the ducts, instead of performing choledochostomy, the operation of choledochenterostomy may be done, the union of the dilated duct to the duodenum being made by means of a Murphy's button. I have twice performed the operation, which has also been done successfully by Dr. Sprengal and Dr. Kiedel, and by Dr. Swaine. In my own cases I removed the shrunken and diseased gall-bladder, and fixed the end of the dilated cystic duct to the bowel by a Murphy's button in one case and by a bone bobbin in another. No drainage was employed. The button was voided at stool on the tenth day. In concluding my lectures I must thank you, Mr. President, and my audience for the kind forbearance which you have shown in listening to details which I fear may at times have been somewhat wearisome. My wish has been to show the importance of the subject I have taken up and some of the results which may be looked for by appropriate surgical treatment, and if I have succeeded in exciting your interest and in making it evident that in the greater number of diseases of the gall-bladder and bile-ducts surgical treatment is well worth considering after a fair, though not too prolonged, trial of medical means, my aim will have been accomplished.

[10] Centralblatt für Chirurgie, April 14th, 1894.

[11] Revue de Chirurgie, Feb., 1893.

ON THE MECHANISM BY WHICH THE FIRST SOUND OF THE HEART IS PRODUCED.[1]

BY SIR RICHARD QUAIN, BART., M.D., F.R.C.P. LOND., F.R.S.,

PHYSICIAN EXTRAORDINARY TO THE QUEEN; PRESIDENT OF THE GENERAL COUNCIL OF MEDICAL EDUCATION, ETC.

IT is a well-recognised fact that the action of the heart is accompanied by the emission of certain sounds, which are described as the first and second sounds of the heart. These sounds, which were observed soon after Laennec had discovered the use of the stethoscope, have been compared to the sounds produced by the utterance of the words "lubb-dup." They have been studied with interest by the physicist, the biologist, the pathologist, and the clinical physician; by the latter especially, inasmuch as the changes produced by disease in the character of these sounds become of material assistance in the diagnosis and treatment of diseases of the heart. An explanation of the mechanism by which phenomena so distinct, so constant, and so remarkable are produced has been sought for by many observers amongst the classes just mentioned.

The second sound is the result of the sudden tension of the semilunar valves caused by the resistance which these valves offer to the retrograde flow of the blood from the aorta and pulmonary artery respectively into the ventricles on the cessation of systole.

[Sir Richard Quain, after referring to the doubt existing as to the cause of the first sound, continued:—]

It seemed to me to be desirable, amidst such differences of opinion, to solve if possible a problem which has its special interest and its special importance. Two of the most striking events which take place during systole—namely, the closure of the auriculo-ventricular valves and the muscular contraction of the ventricular walls—are regarded by many authorities as the sources whence the first sound proceeds. The result of my investigations, on the one hand, leads me to the conclusion that neither of these explanations is satisfactory; and, on the other hand, enables me to indicate what I believe to be the real explanation of the phenomenon.[2]

A. The action of the auriculo-ventricular valves is not the source of the first sound of the heart.—The mechanism of these valves (the mitral and tricuspid) and their action do not possess the elements necessary for the production of such a sound.

[Sir Richard Quain here gave an account of the action of the valves and proceeded:—]

Further evidence on this point may be found in another direction—namely, in the fact that the first sound can be heard independently of the existence and action of mitral and tricuspid valves. Aware of the fact that in some of the lower animals, more especially in the reptile class, the auriculo-ventricular valves exist in but a very rudimentary form, I obtained permission to examine some of these creatures in the Zoological Gardens, and spent many hours on many occasions in the investigation, assisted by my valued friend Dr. John Sibbald.

[Sir Richard Quain then referred to the first sound being audible in the python and the kangaroo—which have only rudimentary auriculo-ventricular valves.]

Objections will, no doubt, suggest themselves to the view above expressed. For example, the clinical physician will say, "I am in the daily habit of hearing a distinct murmur accompanying the systole in cases of diseased heart, and apparently replacing the first sound. On examining the heart after death I find the auriculo-ventricular valves diseased—a condition with which I therefore connect the murmur." It will at once be seen that we have here to deal with morbid sounds, totally different in character and totally different in the seat and mode of production, from the first sound of the heart. To make the explanation more simple I will confine my observations to two principal forms of mitral disease associated with systolic murmur—namely, first, imperfection in structure with distinct regurgitation; and, secondly, induration, roughness, and irregularities on the mitral valve.

[Sir R. Quain described (*a*) the mitral regurgitant murmur, and (*b*) the systolic murmur without regurgitation. He continued:—]

These murmurs, striking and characteristic as they are, are merely accidental complications which occur at the moment of the systole of the heart; but they are unconnected with, and have no relation except in point of time to, the healthy first sound, which may be heard apart from, and independently of, them. The weight of evidence, then, is clearly against the possibility of the structure or the functions of the auriculo-ventricular valves being the source whence proceeds the first sound of the heart.

Two other phenomena occur synchronously with the systole of the heart, and consequently with the occurrence of the first sound. They are (*a*) the contraction of the muscular walls of the ventricles, and (*b*) the propulsion and movement of the blood from the ventricles into the arteries. I shall first consider the supposed share which muscular contraction has in the formation of the sound.

B. The muscular contraction of the walls of the heart during systole is not the source of the first sound of the heart.—The sound produced by muscle during its contraction was first described by Dr. Wollaston.[3] He compared it to "a sound which resembles most nearly that of carriages at a very great distance passing rapidly over a rough pavement."[4] It is very difficult to conceive the slight, soft, rolling sound produced by muscles in action being convertible into the loud, booming first sound of the heart. Yet the theory is accepted. If muscle during contraction could produce so marked a sound, we should expect to find that the powerful muscles of the neck attached to the base of the skull and those attached to the jaw (being through the bones of the skull in direct relation with the hearing apparatus) would give us some striking evidence of the production of muscular sounds when they are thrown into strong action. But there is nothing of the kind. I have failed to hear such sounds when listening to the powerful contraction of the biceps, or on listening to the contraction of the shoulder muscles of a strong cart horse struggling with a heavy load in ascending a hill. I could hear no other sound save the soft, rolling sound described by Dr. Wollaston. Still, many observers have argued that the contraction of the walls of the heart differs from the action of the skeletal muscles, and that it is this peculiar form of contraction which causes the first sound. They have adduced so many observations in favour of this doctrine that it will be necessary to examine them. But before doing so, for the sake of making my argument more clear, I desire to point out that there is another event which occurs simultaneously with the systole of the ventricle. This is the propulsion of the blood from the ventricles and its impact against the column of blood resting on the semilunar valves. With a view to showing how large a share the sound of muscular contraction has in producing the first sound observers have cut off altogether the supply of blood from the cavities, and on listening during the contraction of the heart have heard a systolic sound. Such were the old experiments of Ludwig and Dogiel, represented as confirmed by Krehl[5] and by Kasem-Beck.[6]

The conclusions which have been drawn from these experiments are disproved by those conducted by my friend Professor Halford, and described in his essay on "The Action and Sounds of the Heart," published by Churchill (1860). He writes: "Large dogs were obtained, and, as in my preceding experiments, the heart was exposed, and the circulation kept up by artificial respiration. A stethoscope being applied to the organ, sounds were distinctly heard. The superior and inferior venæ cavæ were now compressed with a bull-dog forceps, and the pulmonary veins by the finger and thumb; the heart continuing its action, a stethoscope was again applied, and neither first nor second sounds were heard. After a short space of time the veins were allowed to pour their contents into both sides of the heart,

[1] A paper read before the Royal Society of London on June 3rd, 1897.

[2] I have to acknowledge with thanks the assistance rendered me in arranging my notes of this memoir by my valued friend, Dr. Mitchell Bruce, during my recent severe indisposition.

[3] Philosophical Transactions, 1810.

[4] It is interesting to note that Dr. Wollaston, in examining the sound produced by the muscles of his leg, made use of a wooden rod to convey the sound to his ear. He may be thus said, in a measure, to have anticipated the principle of mediate auscultation discovered by Laennec in 1816. The muscular sound which we now recognise is that accurately described by Dr. Wollaston.

[5] Du Bois-Reymond's Archiv, 1889, p. 253.

[6] Pflüger's Archiv, vol xlvii., p. 53.

and both sounds were instantly reproduced. On the veins being again pressed all sound was extinguished, notwithstanding that the heart contracted vigorously. Blood was again let in and both sounds restored. I have thus frequently interrogated the same heart for upwards of an hour, and always with the like result" (p. 25). These experiments of Professor Halford must be accepted as sufficient to refute the view of the German observers just quoted. Another source of fallacy in making experiments of this kind is that a very slight stroke of the muscle or ventricle against the end of the stethoscope is sufficient to produce a very loud and distinct sound, resembling the first sound. If the palm of the hand, for instance, be pressed gently over the ear, and the back of the hand be touched by a finger of the opposite hand, it will be felt how slight a stroke is sufficient to produce a very distinct sound. Observers (Ludwig and Dogiel) have recognised the difficulty of isolating muscle from the instrument conveying the sound, and they have placed the empty heart, still contracting, in a jar containing defibrinised blood or warm water, from the side of which a neck is projected covered by a thin layer of indiarubber. At each contraction of the heart a distinct sound, resembling the first sound of the heart, was heard. But the flapping of the heart against the water was quite sufficient to produce the sound which was conveyed to the ear, and I cannot see in such an experiment sufficient evidence of the sound of muscular contraction being the cause of the first sound of the heart.

Experiments of another kind have been emp'oyed to show that the contraction of the muscle is a source of the sound. Hürthle[7] and Einthoven[8] show graphically that the first sound begins with the very beginning of the systole, before the ventricle has got power "to open the valves." This observation is entirely consistent with the view I am about to propose. The moment the ventricle begins to contract the impact of the blood against the semilunar valves commences, producing the commencement of the sound, not when the valves are thrown open. The valves being connected with the fibroid ring surrounding the base of the heart, with which also the muscular walls are continuous, the sounds are conducted to the apex. Pathology confirms this view. It was observed by Dr. Stokes that in the course of typhus fever the first sound of the heart gradually disappears. After death it is found that the walls of the heart are softened, and this morbid state has been accepted as a proof that muscular contraction is the cause of the first sound. The real explanation is that the impulse of the heart is so feeble that it is unable to produce the sound at the valves. The correctness of this view is confirmed by the fact, recorded by Dr. Stokes, that the last point at which the sound disappears is over these valves, and that it is at the same point that the returning sound is first heard.

With the object in view of further investigating this subject I requested my friend, Dr. Alexander Morison, to study the heart of a turtle recently killed by holding it close to the ear as one holds a watch when testing for deafness, and also by pressing it gently against the ear. With this intention I gave him an introduction to the proprietors of the "Ship and Turtle" tavern, where he had the fullest opportunity of carrying out the investigation. Dr. Morison writes to me: "An opportunity was afforded me of examining the hearts of two large turtles immediately after they were killed. The heart removed from the body was easily provoked into active contraction by a gentle tap with the finger, the contraction being sufficient to expel blood from the cardiac cavity. On placing the ear close to the heart whilst thus contracting no sound could be heard; on placing the ear lightly on the heart whilst contracting no sound could be heard. So far, therefore, as a turtle's heart is concerned—no other that I know of has more vigour of contraction after removal from the body—muscular contraction as a cause of cardiac sound must be excluded." These facts and observations are, in my opinion, sufficient to prove that the contractile action of the muscles of the heart is not capable of producing the first sound of the heart.

Having thus endeavoured to show that the cause of the first sound is independent alike of auriculo-ventricular action and of muscular contraction of the walls of the heart, I proceed to consider a third event, the most striking and important of all those which occur during the systole of the heart—that is, the propulsion of the blood contained in the ventricles into the pulmonary artery and the aorta, and herein to indicate what seems to me to be the agency by which the sound is produced.

C. The first sound of the heart is caused by the impact of the blood driven by the action of the muscular walls of the ventricles against the block produced by the columns of blood in the pulmonary artery and aorta which press upon the semilunar valves.—I would adopt the explanation suggested by my valued friend, the late Dr. C. J. B. Williams, that "sound is a phenomenon resulting from resisted motion." Let us examine the condition of the circulation with regard to this particular point—namely, resisted motion. In this inquiry I have derived most important assistance from the admirable and elaborate researches of Professor Bell Pettigrew, F.R.S., first on "The Arrangement of the Muscular Fibres in the Ventricles of the Vertebrate Heart," published in the Transactions of the Royal Society of London, 1864, and, secondly, on "The Relations, Structure, and Functions of the Valves of the Vascular System," published in the Transactions of the Royal Society of Edinburgh, 1864. These refer especially to the left ventricle, but, at the same time, it is to be observed that what applies to this ventricle applies, only in a lesser degree, to the right ventricle. Professsor Pettigrew explains the manner in which the column of blood, projected from the heart into the aorta, is formed by the union of three columns—an arrangement which results from the mechanism of the heart as fully described by him. These columns ultimately unite into one before reaching the orifice of the aorta. The columns have a spiral motion, which is the result of the spiral arrangement of the musculi papillares, of the spiral arrangement of the fibres composing the walls of the ventricle, as well as of the spiral shape of the left ventricular cavity itself. These points, illustrating the character of the flow of the current, are shown in the blood-cast from the interior of the left ventricle of a horse, which, by permission of the President of the Royal College of Surgeons of England, I am able to submit to examination.

By this spiral, or what might be called "rifle," motion the blood is seen to be directed against the segments of the semilunar valves, which are thereby hastily thrown apart, the spiral current being continued for some distance within the aorta. The beautiful rifle mechanism here described is constructed with the definite objects of giving precision to the direction of the moving body against a given point and of securing greater velocity and force in that body—the moving column of blood. We have, in fact, here represented in nature—a matter of the deepest interest to the biologist—the mechanism of the comparatively modern rifle. The resistance to the stream of blood issuing from the ventricle is offered by the block formed by the column of blood resting on the aortic valves. These in their action are described by Professor Pettigrew as "closed by a spiral movement, by which these valves are wedged, and, as it were, screwed, more and more tightly into each other"; the movement here—the spiral movement—being caused by "the direction of the sinuses of Valsalva, which curve towards each other and direct the blood in spiral waves upon the mesial line of each segment."[9]

We find that various estimates have been given of the absolute propelling power of the ventricles and of the resistance of the column in the pulmonary artery and in the aorta respectively. For example, Professor Michael Foster says: "If we take 180 grammes as the quantity in man ejected at each stroke at a pressure of 3·21 metres of blood, this means that the left ventricle is capable at its systole of lifting 180 grammes 3·21 metres high—i.e., it does 578 gramme-metres of work at each beat."[10] Different estimates of the propelling force are given by physiologists, and the estimates of the resistance vary more even than the estimates of the propelling power. It will therefore suffice to say that authorities are substantially agreed that the driving power and the resistance are in the proportion of 4 to 3, the really important point for our present purpose being the relation they bear to

[7] Ibid., vol. lx., p. 283.

[8] Ibid., vol. lvii., p. 617.

[9] Transactions of the Royal Society of Edinburgh, vol. xxiii.

[10] As an illustration of the great mechanical force exercised by the muscular walls of the heart, Professor Michael Foster says that "the work of the whole heart during the day would amount to 75,000 kilogramme-metres, which is just about the amount of work done in the ascent of Snowdon by a tolerably healthy heavy man" (Text-book of Physiology, by M. Foster, M.A., M.D. Lond., 1893). Professor Haughton, F.R.S., in his learned and most interesting work on "The Principles of Animal Mechanics," says that "the daily work of the left ventricle is equivalent to lifting 89·7 tons through 1 foot" (Longmans, London, 1893).

each other. In the motion thus described and the resistance we have all the elements for the production of a sound; and a sound being produced, we ask what it is. The reply must be: the first sound of the heart, the cause of which we now seek.

If it be admitted that sound is a result of resisted motion we have in this instance a remarkable illustration of movement and resistance. The movement of the blood with all the force, precision, and velocity of a rifle or spiral movement is directed against a fixed and definite resistance, the moving power and the resistance being capable of definite measurement and found to be quite sufficient themselves to explain the source of the sound of which we are in search. This explanation was first suggested to my mind many years ago by the occurrence of a case of disease in which the aortic valves, being completely broken down by disease, became inadequate to their function. A murmur of such intensity was produced that it was audible at two or three inches from the wall of the chest without any intermediate communicating body. With a view to determine how far this murmur might be conducted along the course of the circulation I examined the femoral artery. There I found that the murmur was not conveyed to the ear, but a sound precisely resembling the first sound was heard—a sound caused by the pressure of the stethoscope resisting the motion of the blood in the artery, which, the valves being destroyed, thus received the full force of the ventricular contraction. My attention was thereby directed to the obstruction offered by the aortic valves in health to the blood in leaving the ventricle. I felt the case to be so interesting that I submitted it to a meeting of the Harveian Society, and my observation is recorded in the minutes of the meeting, April, 1852. From that time to the present I have taken every opportunity of investigating the subject. Observations have been made on the course of the circulation in the femoral artery under like circumstances by Duroziez, Moulie, von Bamberger, and others. These observations, however, have had reference more especially to the diagnosis of disease of the aortic valves, and I mention them here only as indicative of interesting investigations having been made on the femoral artery in cases of diseased aortic valves. The observers named make no special reference to the first sound of the heart in health.

Objections may be offered to the explanation of the first sound of the heart here brought forward, founded on the fact that this sound is heard more distinctly at the apex of the organ, a point removed from the seat of the valves. The observation is perfectly correct, but the explanation is simple. The muscular walls of the heart are connected, as above described, with the fibroid ring which is intimately associated with the semilunar valves. The sound produced at these valves is communicated to the apex of the heart through the fibroid ring and the muscular walls, which at the moment of systole are tense and firm. The sound thus conducted reaches that portion of the heart which is uncovered, and which is in contact with the walls of the chest. But, on the other hand, when opportunity offers it has been found that the sound in question is heard over the aortic valves more distinctly than in any other situation. A remarkable case of this kind has been related by M. Cruveilhier, who was invited to see an infant just born presenting a complete case of ectopia of the heart. He says: "On examining the heart thus exposed both sounds were distinctly heard over the base, and *not* at the apex." He remarks: "We must not forget that one element of the sound, that produced by the shock of the heart against the chest-wall, is absent."[11]

Another point of interest is that which has already been alluded to in the case of typhus fever, as described by Dr. Stokes—namely, that the sound disappears last over the semilunar valves, and also that the returning sound is first heard in the same situation. It is also an object of great interest to compare the characters of the two sounds in relation to the seat of their origin at the semilunar valves. In the first sound we have the character of propulsive force and sustained action, softer and more prolonged than the second sound, which is sudden, sharp, and short, as if produced by an abrupt mechanical disturbance. These distinctions, which may be readily recognised in various degrees by careful observation, serve to convince us that the sounds are both produced at the same point—at the semilunar valves, each by its own single and simple agency.

[11] Gazette Médicale, 1841, p. 488.

D Lastly, sounds resembling the first (and second) sound of the heart can be produced artificially in accordance with the view contained in the preceding communication.—The experiment is thus made: a sheep's heart of good size (or that of a calf) may be used. It must be carefully cleared from pericardium, leaving the large vessels and pulmonary veins as far as possible intact. The orifices of the pulmonary veins must be laid into one, so as to permit a sufficient opening into the left auricle through which to divide the attachments of the mitral cusps and the musculi papillares in the left ventricle, taking care in doing this not to injure the aortic segments when detaching the cusp that lies next them. The coronary artery must next be ligatured, and also the innominate artery where it springs from the aortic arch. The right auricle and ventricle should be removed. Through the opening made by laying into one the orifices of the pulmonary veins a bone nozzle should be passed. It is well, also, to ligature the auricular appendix and any points from which water may issue when the ventricle is filled. To the posterior orifice of the nozzle rubber tubing should be attached, communicating with a source of water-supply, placed on a higher level; and another portion of rigid guttapercha tubing, about three feet long, should be introduced into the aorta. If, now, the ventricle be filled with water by means of the tube in the left auricle the water will of course pass into the ventricle and thence up the aorta, a portion of the water resting upon and closing the aortic sigmoid valves.

If, further, the ventricle be compressed periodically in imitation of systolic contraction, and allowed to relax in imitation of diastolic relaxation, a sound closely resembling the first sound of the heart will be produced when water is propelled from the ventricle into the aorta, and another closely resembling the second sound when propulsive movement ceases, and the sigmoid valves again close under the superincumbent weight of water in the aortic tubing. As the fluid rises in the guttapercha tube the pressure on the valves increases and the sound becomes more marked; when the fluid, on the other hand, diminishes the sounds become less distinct. If the heart be placed horizontally the sounds become wobbly. The terminal piece of small diameter of a binaural stethoscope gently placed over the aorta at its commencement is most suitable for observing the cardiac sounds in this experiment.

The experiment here described, when first suggested by me, was submitted, with the assistance of Dr. Sibbald, to my lamented friend, the late Dr. Sharpey, and to Sir James Paget, who were quite satisfied that with the increase or diminution of the column the sounds closely resembled those of the heart in man, and that they became more or less distinct in proportion to the quantity of fluid contained in the tube.

In conclusion, I may say that I was moved to undertake and continue this inquiry by a desire to obtain a solution of what seemed to by an insolvable problem, and also by a belief that a correct explanation of the cause of the first sound of the heart would be of practical value in the study of the clinical phenomena of diseases of this organ.

I would wish further to add that the explanation of the cause of the first sound of the heart given in this communication being so different from that hitherto accepted may seem calculated to create difficulties in the diagnosis of valvular disease of the heart. Closer consideration will show, however, this not to be the case, but that, like all accurate knowledge, it will be found to simplify and not to confuse. It will afford an explanation of the relations of certain morbid phenomena which are at present unintelligible—such, for example, as that a systolic murmur may be heard at the apex whilst the first sound is audible at the base free from murmur; and it will serve to encourage a closer study of the relation between muscular contraction of the walls of the heart and the tension of the vessels of the system.

Harley-street, W.

THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC.—The new convalescent home at East Finchley was formally opened by the Duchess of Albany on Wednesday last. The home is designed for certain cases of epilepsy, hysteria, and kindred affections in women and children. The old home was quite inadequate, and the present country branch is a necessity for the successful treatment of a large number of the patients who are now admitted to the hospital in Queen-square. The new home, which contains forty beds, has been built and equipped at a cost of £10,000.

VESICO-VAGINAL FISTULA; WITH A DESCRIPTION OF A NEW METHOD OF OPERATION.

BY E. STANMORE BISHOP, F.R.C.S. ENG.,
HONORARY SURGEON TO THE ANCOATS HOSPITAL, MANCHESTER.

THAT operations for the cure of vesico-vaginal fistula are even now sometimes futile will, I believe, be admitted. Even in the latest list of any importance—that of Milton of Cairo—out of 79 operations 41 were useless. Patients were cured after one operation in 21 instances, after two in 10 cases, after three attempts in 6 cases, whilst 1 case required four operations to effect a cure. In 12 cases no benefit at all was obtained. The lesion is one which is situated in an awkward position for operative work, and one surface at least of the tissue involved is constantly bathed by a fluid which, when it is no longer confined to its own territory, can become very acrid and damaging. Any union which depends for its success upon primary adhesion, if exposed to the action of this fluid, will be extremely likely to break down and allow percolation through into the track of the sutures, and consequent failure. It is necessary, also, with a view to future comfort, that the re-formed bladder should be lined entirely with mucous membrane, any raw surface left being a constant menace, as forming a nidus for the deposition of calculous material. Nothing can be more discouraging to the patient or more exasperating to the surgeon than to see urine once more escaping per vaginam after a tedious and painstaking effort to close the leak. And yet, if the patient determines to leave matters *in statu quo*, she condemns herself to a most miserable existence, the object alike of pity and disgust to all her friends.

Anything like success in the treatment of vesico-vaginal fistula would appear to be a matter of comparatively recent history. Sir James Simpson, writing in 1859, says: "With others I used to regard a patient afflicted with vesico-vaginal fistula as a case generally beyond all relief and all hope." Cumin in 1824 says: "The hopeless nature of these fistulæ is generally acknowledged, and by many they are at once abandoned as incurable"; and Richerand declared that frequent ablutions and a urinal were the *only* means calculated to diminish the trouble inseparable from this disgusting infirmity. And although, as Milton's list shows, present results are not all that could be wished, there has, curiously, been little alteration in the mode of attack by the surgeon during the past fifty years. If the later writers, as Clifford Allbutt and Playfair are consulted, it will be found that all the operations mentioned date back many years, and that in all the edges of the fistula are, without exception, the parts attacked. That they shall first of all be made raw is the essential preliminary, whether the paring method of Sims, Bozeman, Simon, and others, the splitting method of Langenbeck, Collis, and Tait, or the elytroplasty of Jobert and Milton be adopted; the various paring methods differed only in the various angles which the pared surface bore to that of the bladder, the importance attached to preliminary preparation of the patient, the use or non-use of clamps to hold the ends of the stitches or to regulate the position of the flaps, the material of which these stitches were composed, and the position of the patient during operation. The splitting method was the same, whether practised by Langenbeck, Collis, or Tait, and consisted in the splitting from the edge outwards of the tissue between bladder and vagina, so as to obtain a large raw surface at this point. Elytroplasty supplied flaps from various parts of the surrounding tissue, but to fix them in place it was first of all necessary to pare the edges of the existing opening and to fit and suture the raw edge of the flap to these.

The only operation which did not interfere with the integrity of the fistulous edge was the method of desperation, that of kolpocleisis, which transformed the upper part of the vagina into a portion of the urinary reservoir, preventing any escape of the menstrual fluid except through the bladder, and might have been expected effectually to prevent further pregnancy. A case is, however, on record in which this unexpected occurrence actually happened, coition having probably taken place through the dilated urethra. It may be accepted, then, that except in those cases in which any return to the *statu quo ante* is given up as hopeless, the one subdominant idea in the minds of all surgeons who have attacked these cases has been the absolute necessity of a raw surface at the edge of the fistula as the essential preliminary. But is this so essential? Could we not by any means transform this obstacle, on the removal of which surgeons have expended so much time and ingenuity, into our greatest help towards success?

In describing what I think is a novel method I wish to be understood as referring simply to vesico-vaginal fistula, and not to vesico-uterine fistula, although it is suitable for those in the anterior fornix as well as for those lower down in the anterior wall; practically but little is lost by this, since Neugebauer estimated the cases of fistula involving the cervix as only forming 8 per cent. of the whole number, and Hermann and others have pointed out that in the most frequent class, that produced by prolonged pressure of the child's head upon the maternal tissues, the head rarely becomes impacted until after the cervix has dilated and retracted. So far as other causes, such as removal of calculus through the vagina, pressure of impacted pessary, traumatic injury to prolapsed and distended cystocele, as in a case of Kynoch's, go, these will all act on the vaginal wall alone.

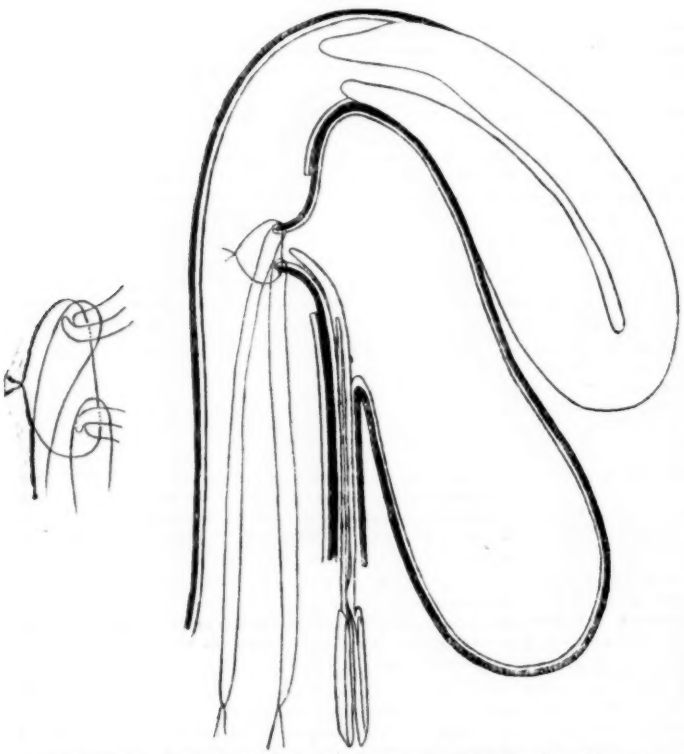
During the last two years my attention has been directed to the subject of fistula generally, and especially to the often unsatisfactory result of the usual operation for fistula in ano. It occurred to me that if it were practicable, good results might be expected from separating the fistulous tube as a whole from the tissues around up to, but not through, its connexion with the rectal wall. Sufficient of this tube should then be removed to leave a projection which could be inverted like a glove finger by means of threads attached to its distal periphery and passed through the fistula into the dilated rectum; by pulling upon these the fistulous tube might be inverted into the rectum and fixed by tying a ligature around it just above the level of the bowel wall. What had been its raw outer surface would now be its inner and might be expected to unite with rapidity, whilst the raw surfaces left outside might be immediately united by sutures. The prolapsed inverted tube might then be partly cut away inside the rectum and the ligature left to cut through the remainder, which would not be likely to happen before the outer structures were solidly united. So far I have not been successful, partly because of the action of the sphincter, but mainly because the fistulous track is very seldom a single tube, but usually burrows in various directions. But neither of these objections hold good with reference to vesico-vaginal fistula. Here we have a short straight track, and if there are muscular movements in the tissues around they are more under control, and will be of importance only if there is coincident tension. The tube, however, as it exists, at first sight would be far too small to have any appreciable effect in stopping the gap; but if, instead of looking upon the edge of the fistula as the limit of our available tissue, we regard it simply as a hinge upon which a tube of mucous membrane taken from the vagina and spreading outwards may be made to turn, we have at once at our disposal as much as may be necessary to close any but the most extensive gaps. Both bladder and vagina are lined by the same kind of tissue, mucous membrane, and it is the continuation of this over the edges of the rent which has been heretofore the greatest trouble. Supposing exception to be taken to this, and the edge be looked upon as scar tissue pure and simple, still it is the same tissue as that which it is intended to form by any of the other operations, with the cardinal advantage that it is old and tough, and has passed beyond the dangerous stage in which absorption of deleterious matters is possible.

It is clear that it is the re-formation of the bladder which is the essential point. The union of any raw surfaces in the vagina, although important, is of but secondary importance except so far as it may support or strengthen the re-formed bladder wall. If, then, we utilize the vaginal mucous membrane, not as Jobert or Milton, by displacing it as a flap with two raw edges, which require suturing to the equally raw edges of the prepared fistula, with a granulating surface exposed to the action of urine, but with the mucous surface turned towards the bladder cavity, where alone that kind of surface is of primary importance, and with no break in the edges at all, but making a perfectly continuous surface up to a narrow point of union, we shall have gone far towards solving the problem, and the loss of material in the

vagina will be of very little consequence compared with the advantage obtained.

Acting upon these ideas I suggest, and have carried out with immediate success, the following operation. I pass over, as understood, the extremely necessary preliminary preparation of the patient. The accompanying diagrams will make clear the steps of the operation and the idea of it almost without description. In Fig. 1 it will be seen that a circular incision has been made around the fistula, passing through the mucous membrane and part of the subjacent tissue, so that a continuous flap of sufficient thickness can be raised and separated up near to, but not through, the angle at the fistulous edge; the width of this flap must be judged by the surgeon in each particular case. It must, however, be wide enough, when brought together in the way to be described, not merely easily to close the opening, but to project for about a fourth to third of an inch into the bladder cavity at the centre. When so separated it lies like a truncated glove finger attached solely at the edge and continuous with the mucous wall of the bladder. To four equi-distant points in this frill four long double threads are attached, but not knotted, so that they will easily pull out. Each pair is knotted at their ends outside the vagina. Of course, in a section such as shown only two of these double threads can be indicated. When this is done a curved pair of forceps is passed through the urethra until its beak appears in the centre of the frill, the four pairs of threads are brought together, and their knotted ends placed within the grip of the forceps. As this is withdrawn, closed, it will carry the threads through the fistula, through the bladder, and out through the urethra. Gentle traction upon these (see Fig. 2) will invert the circular flap into the bladder in such a way that mucous membrane will face the bladder, whilst the raw connective tissue, surface will face itself and come easily together at the level of the bladder-wall, whilst the innermost edges project as a tube into the bladder cavity; the advantage of this will be shown directly. Whilst traction upon these threads is very gently but firmly maintained, and before the frill is inverted, a fine silk suture is carried round it just above its extremity, the suture passes through the connective tissue, but carefully avoids the mucous membrane. (Fig. 3, enlarged detail). It lies like a purse-string, and it is tightened up just after the inversion takes place. It draws together the raw surfaces of what before inversion was the outer, but is now the inner surface of the frill, and closes the upper extremity of the tuft. When knotted, the ends of this suture are cut off short, and the whole suture is buried by the further inversion produced by a continuance of the traction upon the guiding threads. As soon as this inversion has been carried to such a point that the surfaces of the flaps lie easily in apposition at the level of the bladder-wall another circular suture is applied in the same way and knotted, the ends being cut off. In small fistulæ only one of these sutures may be required; that should always be the one at the level of the bladder-wall. The guiding threads are now divided and drawn out through the urethra, leaving the base of the bladder re-formed (see Fig. 3). As is well known, divided mucous membrane tends to curve over its raw edge. When, therefore, the first suture is tightened the upper surface of the tuft will present nothing but mucous membrane. Fig. 4 shows the appearance of the fistula from the vagina at this stage. The raw surfaces in the vagina, if sufficiently small to be drawn together without tension, are now united by silkworm gut sutures, the ends of which are left long to permit of easy removal. If, however, any tension is likely to be produced, it is better, I think, to apply at once a Thiersch graft taken from some non-hairy portion of skin. This is covered by oiled silk or guttapercha tissue, and carefully pressed into position. I find careful packing of the vagina with iodoform gauze better than sutures to fix this in position. The patient is made to lie upon her face for ten days, and the catheter is used every two hours the first three or four days.

FIG. 1.

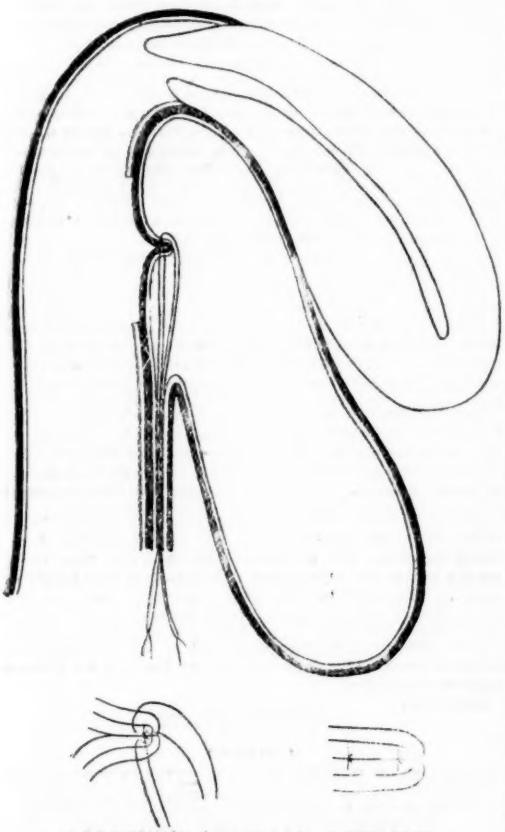


The flap has been separated and turned into the vagina; two guiding threads are shown in position and the first uniting thread, which passes only around through the connective tissue and muscular coat avoiding the mucosa. A pair of bent forceps is passed through the urethra, its point entering the vulva through the fistula. The guiding threads will be turned up into the vagina and their knots placed between the jaws of the forceps.

The advantages I conceive to be obtained by this method are:—1. There is no tension upon the uniting surfaces. 2. Mucous membrane is opposed to the action of urine—that is to say, the contents of the bladder find themselves in contact with the kind of tissue to which they are normally suited and accustomed. 3. The cubic capacity of the bladder is not greatly decreased, as is the case after most of the other operations, but is left normal; therefore, the resulting cure is not discounted by persistent frequency of micturition in after life. 4. The uniting sutures are separated from the contents of the bladder by the entire thickness of the mucous membrane. 5. The uniting surfaces are also thus protected; with the patient on her face, if any urine is projected against the tuft it will drip from its outer layer, which is mucous membrane. 6. Should the ureter be exposed at the edge of the fistula, or should its orifice, which happens in most cases, be near it, it will not, as in the old operation, discharge right on to the line of union, but into a gutter formed of mucous membrane, which cannot be damaged by such discharge, and it will also be noted that it is impossible for the ureteral canal to be compressed by a wrongly-placed stitch, fixed in the middle of the scar, or left outside the re-formed bladder—it must necessarily be

turned in by the flap thus formed and left in a safe position. 7. In old cases—where, especially, freedom from muscular traction is of most importance—we are provided with a natural replica of Simpson's splint in the tough edge of the fistula, now surrounding the uniting tissues, all the

FIG. 2.



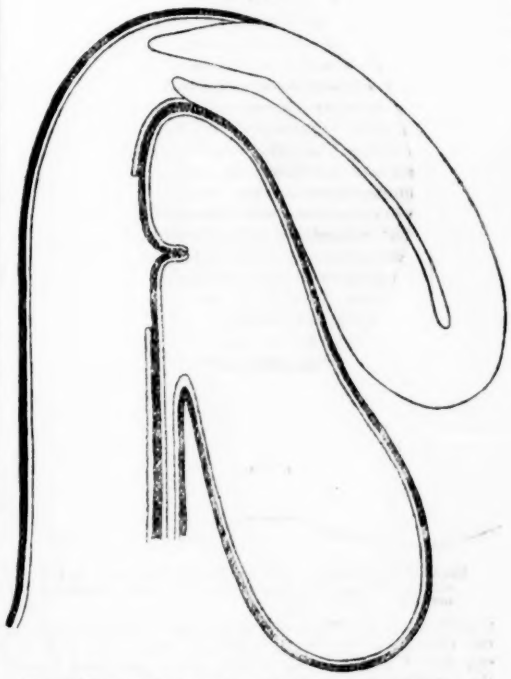
In Fig. 2 the guiding threads have been drawn through the urethra pulling the circular flap or frill into the bladder. The first uniting thread has been drawn tight and knotted, closing the upper extremity of the frill. This is shown also in enlarged detail. The two uniting threads are shown tied, and the frill thus closed above and below.

more effective because it is situated in the tissues themselves. This is another instance of the way in which the altered conditions produced by the operation transform the previous obstacles to success into distinct advantages.

Since this paper was written my attention has been called to one by Professor Ferguson, of Manitoba, in the *American Journal of Obstetrics*, and it is evident that the principle of reversal of mucous membrane from the vagina, which I thought had been original, has been anticipated by him. His operation, however, is otherwise quite different from the one I have described, and does not, I submit, appear calculated to gain all the advantages which are possible. Professor Ferguson separates the mucous membrane of the vagina in much the same way as I have shown, but he makes his flaps only large enough to meet one another easily on a level with the floor of the bladder. They are united in that position by a continuous suture, avoiding the mucous membrane so as slightly to invert the line of union. There is no attempt to pull them inwards into the bladder or to agglutinate them together into a tuft. In all cases the vaginal wound is directly united by interrupted sutures. It appears to me that, first, the resulting line of union will be practically on the same plane as that of the bladder wall, therefore the amount of uniting surface will be much less, consequently the risk of yielding, both immediate and secondary, will be much greater. And most of all, the discharge of urine from the ureters will play directly upon the uniting edges and may very easily contaminate the sutures. As Simpson said in criticising the operations of his day: "There is the danger of infiltration of urine between the raw lips of the wound on the vesical side, provided the internal surfaces of the lips are not entirely closed, which they can scarcely in all cases be expected to be, by the sutures employed." Perhaps the difference between the two operations will be even more clearly apparent if I refer to a kindred condition, differing mainly in position. In supra-pubic cystotomy, when for some reason the bladder has not been immediately closed, a time will come when the opening is no longer required and closure is desired. Closure will here sometimes occur from simple cicatrisation, but now and then it does not. If the bladder-wall be separated from the abdominal, the edges of the opening in the former pared and simply brought together by sutures, one often fails to get primary union, and leakage again occurs; but if the circumference of the opening be drawn in by threads which are carried through the urethra, and the outer surface drawn together by a purse-string suture, the result will be found to be perfect. At least, I have had that double experience.

It would, of course, be presumption to suggest that this method will meet the requirements of every possible case. He is the best surgeon who, with full knowledge, chooses the method best fitted for the individual case which engages his attention, but the more methods he has at his disposal the better will he be equipped and the more likely are his

FIG. 3.



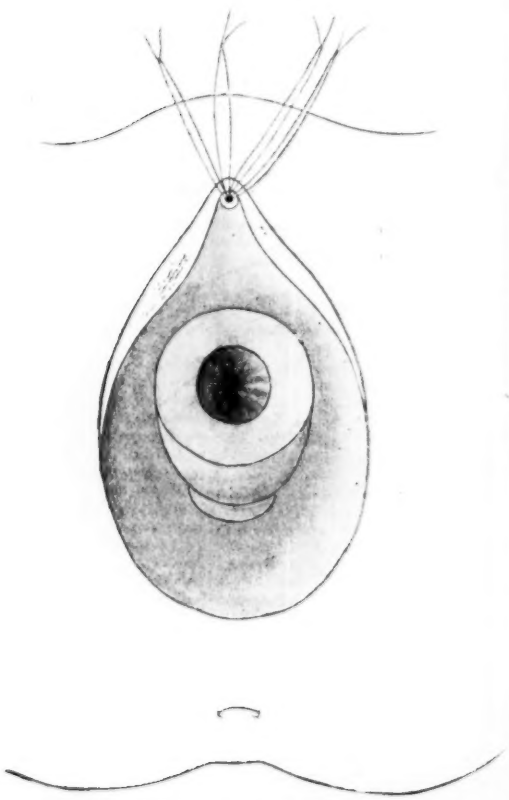
The guiding threads have been divided and withdrawn, leaving the base of the bladder re-formed with no threads exposed to the action of the urine.

efforts to be crowned with success. The following cases show the result so far obtained. It will be noted that in all there was never the slightest leakage from the time of operation.

CASE 1.—A medium-sized woman, aged thirty-one years, was admitted to hospital on Sept. 22nd, 1896. She had had two children. In the case of the first—who was at this time ten years old—labour was easy, and there were no after-effects. The second was a six months

dead child. Labour was tedious and was terminated by instruments. The patient had no difficulty with the urine directly after her confinement, but about a fortnight after she first noticed urine trickling from her vagina; this had become much worse lately. She was in bed for three weeks after confinement with, she says, rheumatic fever. In front of the cervix and about half an inch from the vaginal reflexion was an opening which admitted barely two fingers. The opening was smooth and the edge thin. The vagina was slightly excoriated, but there were no deposits. The urine was of specific gravity 1015, acid, and with a very faint trace of albumin. After careful douching, &c., the vagina appeared to be healthy. On Oct. 6th the operation was performed with one purse-string suture. The vaginal wall was united by interrupted silkworm gut sutures. The patient was placed on her face. A catheter was inserted and kept *in situ*. The vagina was irrigated daily with

FIG. 4.



Shows the appearance of the re-formed bladder from the vagina. The guiding threads are shown issuing from the meatus.

boracic solution. There was no leakage after the operation. On the 17th the vaginal sutures were removed and the wound healed. The patient could pass urine herself. On the 29th she was discharged, when she could hold urine six hours easily.

CASE 2.—The patient was a tall, masculine looking woman, aged twenty-eight years, with a flat pelvis. She had had one confinement, which lasted two days and was terminated by craniotomy, which occurred one year previously, when she was five weeks in bed. She had noticed a leakage before getting up. On Nov. 3rd, 1896, the opening admitted two fingers easily; the vagina was tender, somewhat raw, and encrusted in small patches. The urine was slightly alkaline and of specific gravity 1016. By the 20th careful nursing and the use of salol and mineral acids with local treatment produced a fairly healthy vagina, with acid urine, and the operation was performed with two purse-string sutures. A graft was taken from the thigh below the trochanter. The vagina was packed with iodoform gauze. The patient was placed on her face and the catheter was passed every two hours. There was no leakage of urine. On the 23rd some gauze was removed and the vagina was repacked. On the 26th there had been no leakage and all the gauze was removed. Almost all the graft had united, except at one side. This was sloughing and nearly separated, and was cut away, leaving a raw space measuring one inch, which was, however, cicatrising. Douching was performed daily with boracic solution which was followed by insufflation of dermatol. On the 30th there was still no leakage. The patient had passed urine herself. She was not allowed to hold it for more than four hours, but she could do so. She was placed on her back. The vaginal wall had nearly healed. On Dec. 10th the patient was allowed to go home. There had been no leakage. She could hold urine for six hours. The vagina was perfectly healed and felt supple. The grafted patch felt somewhat thinner and smoother than the remainder, but there was no bulging.

CASE 3.—A medium sized woman, aged forty years, married at the age of thirty-five years, had had one child seven months previously to coming under my notice. The labour was tedious, but no instruments were used. A leakage was found on the fifth day. Convalescence was slow. There was no fever. The patient had undergone one operation by another surgeon, but the leakage returned; she was not sure how soon after, but thought that there was some during the first week. On Jan 2nd, 1897, there was an opening of the size of half-a-crown in the anterior wall near the centre, the edges of which were scarred. The patient was very cleanly and the vagina was only slightly sore. The urine was acid, of specific gravity 1020, and there was no albumin or sugar. On the 5th the operation was performed with two purse-string sutures. The vaginal edges were approximated with silkworm gut, two lateral incisions being made to relieve tension. She was placed on her face. Daily douching was performed after the first four days, during which the vagina was lightly packed with iodoform gauze. The catheter was used every two hours for two days, after which she passed urine naturally, but was not allowed to hold it for more than three hours at a time. On the 20th the vagina had healed. The suture was removed on the 13th, and the patient has had no leakage since the operation.

Manchester.

A CASE OF

ADDISON'S DISEASE IN A CHILD TREATED FOR A FEW DAYS WITH SUPRARENAL EXTRACT WITHOUT BENEFIT; CHARACTERISTIC LESIONS FOUND POST MORTEM.

BY JUDSON S. BURY, M.D. LOND., F.R.C.P.,
SENIOR ASSISTANT PHYSICIAN TO THE MANCHESTER ROYAL INFIRMARY.

THE following case is noteworthy on account of (1) the early age of the patient—Addison's disease being exceedingly rare under the age of fifteen; (2) the history of a temporary discolouration of the skin occurring one year before the onset of the definite symptoms of the disease; and (3) the family history of phthisis and of brain disease. As regards the treatment of Addison's disease some recently reported cases strongly suggest that an extract of the suprarenal capsules may prove to be of great service. Many of these cases are reviewed by Dr. Ringer and Dr. Phear in a paper published in the Transactions of the Clinical Society for last year. They record a case of their own in which temporary improvement followed the administration of suprarenal extract; the pigmentation diminished in intensity and the patient became brighter and stronger.

A girl, aged thirteen years, was admitted under my care at the Manchester Royal Infirmary on June 6th, 1896. Her mother told me that she was always a delicate child, was easily tired, and always seemed to be very sleepy. When an infant she attended a children's hospital for rickets and diarrhœa, but did not suffer from any other definite illness before the present one. She had never had a severe fall or

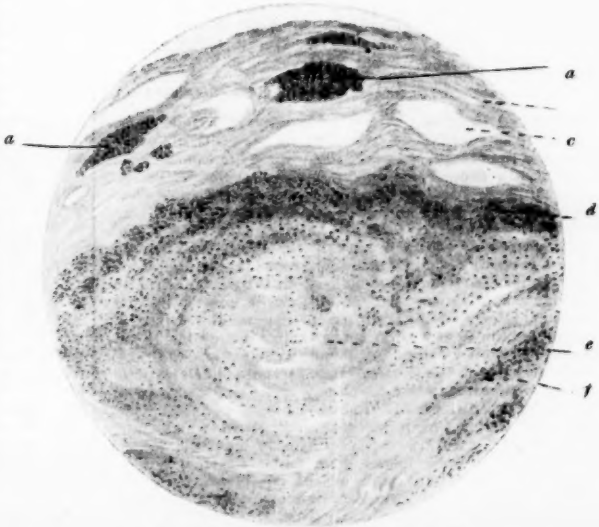
received any bodily injury. About two years ago she stayed for two or three weeks with some friends at Alderley Edge. On her return to Manchester it was noticed that she looked dark coloured, as if much sun-burnt. The neighbours said "if she had stopped there another week she would have been quite black." "Her body was brown all over." But in a few weeks she became a natural colour again. The present illness began about twelve months ago with symptoms of gastric disturbance; thus "she could not take her food properly; it turned on her stomach, and she began to vomit." Sometimes she vomited several times a day. She also suffered from severe headache. On three occasions she fainted. A few weeks from the commencement of her illness a change in the colour of her skin was noticed, and it gradually became darker. The schoolmaster used to send her home from school because she had not washed herself properly, and the patient used to cry when she got home, saying, "I had washed myself." She left school on Jan. 20th—her thirteenth birthday. During the last two months she vomited every other day, and gradually became weaker. She was the eldest of a family of ten, of whom four other children were living and well. The others died in infancy—one from whooping-cough and convulsions, another from convulsions, another from "dentition," another from hydrocephalus, and another from congestion of the brain. Her mother's sister died at the age of thirty-five years from phthisis, and a sister of her father died aged thirty-one years from epilepsy, dementia, and phthisis. On admission she was found to be a thin, slenderly-built child, and had obviously wasted to a slight degree. The discolouration of the skin was the most striking feature; she looked like a Mulatto, all parts of the surface of the body being of a brown colour. The tint varied in depth in different parts, but the transition between a dark brown and a light brown was everywhere quite gradual. The bronzing was most intense at the back of the neck, on the dorsum of the hands, on the lower part of the abdomen, and over the knees; it was least intense on the palms of the hands, the soles of the feet, and over the calves of the legs. No pigmented moles could be found. The nails were of normal colour and the conjunctivæ were pearly white. A faint, patchy pigmentation was seen on the mucous membrane of the lips and the inside of the mouth. The tongue was free from discolouration. No enlarged glands could be found and nothing abnormal could be detected on a careful examination of the chest and abdomen. She complained of pain in the epigastric region, which was worse after food. There was slight tenderness on pressure over each lumbar region, and palpation set up tonic spasm of the abdominal muscles. The spine was free from pain and tenderness. The pulse was 96, regular and feeble. The urine was acid and free from albumin and sugar. The patient was able to walk, but her appearance and action exhibited great feebleness. There was no paralysis and no alteration of cutaneous sensibility. The knee-jerks were increased and the wrist-jerks appeared to be unduly irritable; there was no ankle clonus. The superficial epigastric abdominal and plantar reflexes were exaggerated. She was ordered a bismuth and soda mixture and on June 9th half a tabloid of suprarenal extract to be taken three times a day. On June 16th a freshly made extract was substituted for the tabloids; suprarenal capsules from the sheep were pounded up in a mortar with glycerine in the proportion of one capsule to a drachm of glycerine, and a teaspoonful of the mixture was given three times a day. Since admission the patient had often vomited and no improvement could be noted in her general condition. On June 17th she became decidedly worse, and the pulse was only just perceptible. At 4 30 on the morning of June 18th she had a convulsion and became unconscious. At 10 A.M. she lay with her eyes half open in a state of deep coma; no pulse could be felt at the wrist, and the heart sounds were almost inaudible. The respirations were about 36 to the minute and irregular in rhythm, and inspiration was accompanied by gaping movements. She died at noon.

Necropsy. — At the necropsy made by Dr. Kelynack on the following day the suprarenal capsules with adjacent portions of the spleen, liver, kidneys, and other tissues were carefully removed for subsequent dissection and examination. But few changes were found in any of the other organs. The membranes of the brain were unduly congested; several hæmorrhages were found beneath the visceral layer of the pericardium; there were some slight pleuritic adhesions on the left side of the chest but none on the right side. The bronchial and other glands were normal and no signs of tubercles could be found in the lungs or other organs. The thyroid gland was smaller than natural, but otherwise normal. The abdominal cavity did not present any abnormal appearances, and the spleen, liver, kidneys, stomach, and

FIG. 1.

Longitudinal section of the left suprarenal body as seen by the naked eye.

FIG. 2.



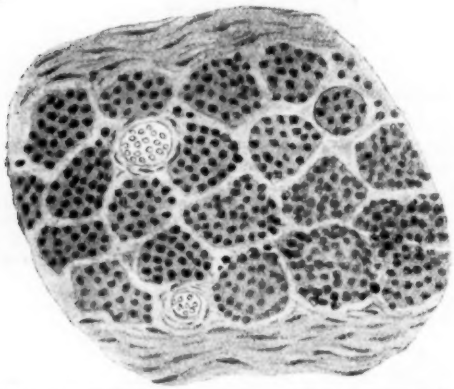
Section of suprarenal body (Hartnack ⅛ in., oc. 3).

intestines looked quite healthy. The adrenals were enlarged and firm and adherent to the surrounding tissues.

For the following report and accompanying drawings I am indebted to my friend Dr. W. E. Fothergill: "The right and larger body had the usual cocked-hat shape. A piece of diaphragm was adherent to one end of it; also several flakes of fat. Its length was 6·5 c.m., its breadth 1·5 c.m., and its depth 2 c.m. The coverings of fat and connective tissue were closely adherent to the organ, so that no definite fibrous capsule could be found. Transverse sections did not show the usual differentiation into cortical and medullary portions of tissue. The organ was rather seen to be composed throughout of irregular septa of fibrous tissue which separated masses of light colour and caseous consistency. There were cavities centrally placed in several of these masses. The left and smaller body was less regular in shape than its fellow, being thicker and deeper at one end than at the other. It still, however, would be recognisable as a suprarenal body. Its length was 4 c.m., its breadth 1·2 c.m., and its depth 1·5 c.m. Splitting it from end to end, it gave tough resistance to the knife, and a distinctly gritty feeling was recognised in parts, which on subsequent examination were found to be calcareous. The structure was altered just as in the other body, there being no cortex or medulla visible, but irregularly distributed caseating masses of varying size separated by fibrous septa. (See Fig. 1.)

Microscopical examination.—"Slices of both bodies were hardened and cut by the paraffin method, the celloidin method, and the combined method. The inspection of these showed both bodies to be in an exactly similar condition. As regards the characteristic structure of suprarenal bodies, the condition was as follows: The capsule was thicker and denser than usual, and contained numerous blood-vessels.

FIG. 3.



An island of unaltered cortex—a portion of Fig. 2, *a* (Hartnack ⅓ in.).

The cortical layer was recognisable only in a few places, notably in small islands surrounded by fibrous tissue, which lay round the margin of the organ embedded in the thickened capsule. In these islands were groups or columns of cells lying packed together in the interstices of a delicate fibrous stroma. They had large round nuclei, which stained deeply with hæmalum. The cell outlines were faint. There was no trace of the medullary layer, or of the vessels or nerves supplying the organ. Thus within the thickened capsules all the tissues were altered. In the centre of each of the masses of caseating matter was amorphous débris staining faintly with eosin or picrocarmine (Fig 2, *c*), around this was more débris, staining more darkly and having scattered through it the nuclei of the cells characteristic of the cortical zone. These nuclei stained deeply with hæmalum, and closely resembled those in the islands of normal tissue. Round this band of incompletely destroyed tissue was a layer (Fig. 2, *d*) in which fairly healthy cells were crowded very closely together, so that their deeply stained nuclei gave under the low power a purple zone round the pink of the débris in the centre. There was, however, no trace of the characteristic arrangement in columns of these cortical cells. Round the whole mass was fibrous tissue (Fig. 2, *b*) arranged in concentric layers, and enclosing vessels (Fig. 2, *c*). No giant cells were visible in any of the sections examined. But the lesion was undoubtedly tuberculous in appearance. The semilunar ganglia and a portion of the left great spanchnic nerve were examined microscopically, but there was no evidence of any pathological change in these structures."

Manchester.

A SIMPLE APPARATUS FOR GASEOUS DISTENSION OF THE COLON:

WITH NOTES OF THREE CASES OF INTUSSUSCEPTION TREATED BY IT.

BY R. A. LUNDIE, M.A., B.Sc., M.B., F.R.C.S. EDIN.,
ASSISTANT MEDICAL OFFICER, LONGMORE HOSPITAL, EDINBURGH.

IN a case of intussusception that came under my care some years ago I tried, among other methods of treatment, the introduction of the contents of a syphon bottle of soda-water through a rectal tube, as recommended by Treves[1] and others. While it did produce a rapid distension of the colon, this was obviously much less rapid than would have been the case had gas alone been used, and when the bowel contracted and expelled the mixture of water and gas it returned not without discomfort and inconvenience. The latter disadvantage is also present in the method strongly recommended by Von Ziemssen[2]—viz., introducing in succession into the rectum solutions of bicarbonate of soda and of tartaric acid. In the house where my next case occurred there happened to be a seltzogene, and it struck me that this could be made to answer my purpose better than an ordinary syphon. I found, as I expected, that it was a great improvement, and showed the device to the Edinburgh Medico-Chirurgical Society.[3] As I recently had the opportunity of using it in another case I think it well to make it more generally known.

The illustration renders description almost superfluous. It will be seen that the upper globe only is charged; I have found the most convenient method of effecting this to use the tartaric acid in large crystals, not in powder, in order that its solution and the consequent evolution of carbonic acid may be somewhat delayed. Pour as usual the charge, first of tartaric acid and then of bicarbonate of soda, into the

[1] Intestinal Obstruction, p. 444.
[2] Deutsches Archiv für Klinische Medicin, 1883, vol. xxxiii pp. 235-245.
[3] Vide Edinburgh Medico-Chirurgical Journal, June, 1893, vol. xxxviii p. 1146.

upper globe of the seltzogene; after adding a little water quickly withdraw the funnel, introduce the tube, and screw it home as speedily as possible. A piece of plain india-rubber tubing, with a rectal nozzle attached, completes the apparatus.

The patient's lower bowel should be emptied by an ordinary enema before distension with gas is tried. If this has been done it will be found possible to distend the colon several times in succession, allowing it time to expel the gas before more is introduced, without disturbance from escape of fluid. I have not found it necessary to press the buttocks together round the tube, or to resort to other means of preventing the escape of the gas, and so of increasing or prolonging the pressure and the distension of the colon. This could easily be done when desirable—e.g., if the method were employed for diagnostic purposes. Nor have I found it necessary to give chloroform; when pain is produced, though it may be sharp, it is only momentary. When the tap is opened it will be found that the gas escapes and the patient's abdomen distends very rapidly; a second or two will probably suffice to inflate the colon as much as is required. In this rapidity, it seems to me, lies the chief advantage of the method in the treatment of intussusception; strong and even pressure is brought to bear so quickly that the constricting muscular fibres have probably not time to contract in response to this stimulus until it has reached its full strength. As a dislocated shoulder-joint may sometimes be reduced with ease if the patient be taken unawares, and reflex fixation of the muscles thus avoided, so I think this sudden distension of the intestine anticipates, and so to a large extent escapes, the impediment to reduction caused by that reflex fixation of the intussusception which any stimulation of it is sure to produce. The latter case, moreover, presents one great advantage over the former; for the latent period of the unstriped muscular tissue with which we have to do is much longer than that of voluntary muscle.

It may appear at first sight a violent and dangerous method of treatment; but it must be remembered that the intestines are supported by the abdominal wall, and that so long as there is no gangrene or deep ulceration rupture is hardly possible. Indeed, Von Ziemssen says that he has tried in vain to rupture by inflation outside the abdomen intestine taken from the cadaver while still warm. If, however, the symptoms have been so severe or of such duration as to suggest the possibility of gangrene, inflation should not be attempted unless the operator is prepared to proceed at once to laparotomy in case of rupture. Though my experience is confined to cases where I believe intussusception was present, I have no doubt that this method might safely and profitably be employed at an early stage in various other forms of obstruction. In Von Ziemssen's paper above referred to many conditions are enumerated in which distension of the colon with gas may be of use both for diagnosis and treatment; and in any of these I think the device above described would be found convenient. It has probably been employed before, but I have been able to find no mention of it, and hope this note may induce those who have the opportunity to give it a trial.

I append very condensed notes of all the three cases in which I have used the apparatus. If the symptoms and signs observed do not actually demonstrate the presence of intussusception in any of them, yet that appeared to be the most probable explanation of severe and alarming abdominal symptoms in each; and as in each inflation was followed by immediate and striking improvement, and seemed the turning point in a very anxious case, their interest is not entirely dependent on the accuracy of that diagnosis.

CASE 1.—A woman, aged sixty years, was subject to occasional diarrhœa. On Oct. 11th, 1891, she had sharp pain in the abdomen on awaking in the morning. There was much vomiting. A small hard lump was noticed in the region of the gall-bladder. Morphia was administered. On the 12th there was much pain and vomiting. There was a much larger lump, very tender, elongated, below and parallel to the margin of the liver. The colon was thrice inflated in the evening; she had sharp pain each time. The elongated tumour had gone, and the pain and the tenderness had very greatly diminished. On the 13th there was renewed pain, but less severe; it was not relieved by inflation. This proved to be due to fæcal impaction, which was removed by enemata of olive oil continued for some days. Subsequently the patient had several attacks of fæcal impaction in the same region, but without anything to suggest intussusception. She died in 1895 from malignant tumour in the right hypochondrium. The exact origin was not made out.

CASE 2.—A delicate woman, thirty-four years of age, was subject to occasional attacks of abdominal pain. On the evening of Oct. 31st, 1892, she experienced sudden violent pain in the abdomen more severe than ever before, but not distinctly localised. The patient was much collapsed. No tumour was made out. Morphia was administered hypodermically. On Nov. 1st the pain and vomiting were controlled only by morphia. In the evening inflation gave no relief. Some blood-stained mucus was passed. On Nov. 2nd the patient was much in the same condition. In the evening inflation was repeated. There was sudden, sharp, localised pain above the pubes, followed by great relief. No more morphia was required, and rapid recovery followed.

CASE 3.—A boy, aged eleven years, healthy, but not very robust, on July 11th, 1896, after unusual exertion, ate a large and hurried meal, and continued to rush about afterwards. At 6 P.M. he was seized with sudden pain on the right side of the abdomen. There was localised tenderness from the liver to the right iliac fossa. Repeated vomiting occurred, followed each time by temporary relief. The symptoms continued after the stomach and bowels were empty. The patient had broken, restless sleep. The pulse was quick and small. The colon was thrice inflated in quick succession on July 12th, at 2 A.M. There was sharp pain at the time. Great relief followed; the pulse improved and sleep was sound and quiet. Vomiting continued at longer intervals till noon, but without any other bad symptom. Recovery was rapid.

Edinburgh.

A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Procemium.

ST. GEORGE'S HOSPITAL.

A CASE OF ACUTE PULMONARY GANGRENE IN A HEALTHY YOUTH; PYOPNEUMOTHORAX WITH SEVERE SYMPTOMS; INCISION AND DRAINAGE; RECOVERY.

(Under the care of Dr. W. EWART and Mr. MARMADUKE SHEILD.)

IT is curious that so striking a condition as gangrene of the lung was practically unrecognised until it was described by Laennec[1] in 1823. It is usual to deny the existence of cases of primary gangrene, cases in which there is no preceding morbid condition; but undoubtedly cases do occur, as the following report shows, in which pulmonary gangrene suddenly appears in persons who are, so far as can be ascertained, perfectly healthy. V. Babés[2] maintains that careful inquiry will always elicit some source of infection, such as tonsillitis, and Volkmann has insisted on the etiological importance of minute portions of food penetrating into the respiratory passages. The occurrence of micro-organisms in the sputum of pulmonary gangrene was first noticed by Virchow[3] in 1846; he described sarcinæ, and the frequent presence of the same bodies was recognised by Fischer.[4] In 1866 Leyden and Jaffé described the leptothrix pulmonalis as constantly occurring in pulmonary gangrene,[5] and their results were confirmed by Kannenberg.[6] Recent researches agree in the importance of bacteria in the production of gangrene of the

[1] Traité de l'Auscultation Médiate, deuxième édition, vol. i., p. 443.
[2] La Semaine Médicale, Dec. 18th, 1895.
[3] Froriep's Notizen.
[4] Ueber der Vorkommen von Sarcinen im Mund und Lungen, Deutsche Archiv für Klinische Medicin, 1885, vol. xxxv.
[5] Ueber Putride Sputa, Deutsche Archiv für Klinische Medicin, 1866, vol. ii.
[6] Ueber Infusorien im Sputum, Archiv für Pathologische Anatomie, 1879, vol. lxxxv.

lungs, without, however, according to the leptothrix the exclusive *rôle* which Leyden and Jaffé attributed to it. There is probably no specific organism. The following case is one of those in which the gangrene is very superficial, when, as was first pointed out by Corbin,[7] consecutive pleurisy, often accompanied by pneumothorax is very common. The satisfactory result of the case is probably greatly due to the early stage at which the pyopneumothorax was drained.

A young man, aged eighteen years, was admitted into St. George's Hospital on April 14th, under the care of Dr. Ewart, suffering from pain in the back and cough. He had always been in good health and had never suffered from a cough; when a child he had measles, but had never had influenza. He was a teetotaler. His family history was good, and no relative of his had had phthisis. In appearance he was delicate, tall, and rather thin. His nails were almond-shaped and striated. On April 8th, about ten o'clock in the morning, the patient had been attacked by a feeling of chilliness. This, though severe, hardly amounted to a rigor, as his teeth did not chatter, and there was but slight shivering. He was able to keep about, but on April 9th he had to take to his bed, as he was seized with severe pain in the left shoulder (supra-spinous region), passing downwards to below the inferior angle of the left scapula. On the 10th the pain and cough continued, but he did not expectorate; his weakness was so great that he was compelled to lie on his back, and he was unable to move. For the next four days the pain persisted and the cough also, but still there was no expectoration. He felt hot at times and sometimes shivered. On examination, after his admission on the 14th, he looked very ill and lay on his back in bed, and complained of his weakness and inability to move. His lips and ears were slightly but distinctly cyanosed. The pulse was 88 and the respirations were 36. His heart was apparently normal, no murmurs could be heard, and the apex beat was situated in the fifth space two and a half inches from the sternal margin. On auscultation numerous scattered râles could be heard over both sides of the chest in front. Behind, on the left side, there was dulness downwards from the inferior angle of the scapula, with weakening of the breath sounds, and vocal resonance was deficient over the same area. Scattered râles could be heard on both sides. Owing to pain and fixation of the chest he was unable to spit out the secretion which rose. His tongue was greatly furred. The urine was normal. His temperature was 101° F. A diagnosis of diffused broncho-pneumonia, probably post-influenzal in origin, was made. In the evening of this day the temperature rose to 102·4°; he had a fairly good night, but on the morning of the 15th it was noticed that his breath was very offensive when he coughed. The temperature was normal at 10 A.M., but in the evening it rose to 101·6°. On the 16th the cough continued to be very severe, and one fit of coughing culminated in his vomiting a large amount of whitish foul-smelling muco-pus. The pain continued to be severe. The evening temperature was 99°. On the 17th he felt much more comfortable; his cough was decidedly less, but he had brought up a small quantity of extremely offensive sputum. His face was less flushed. From the 18th to the 25th the symptoms and physical signs continued unchanged, except that dulness in the left upper scapular region became noticeable. He slept well, and his temperature, though very variable, hardly rose above 101°. During the night of the 25th he complained of severe pain in the lower part of the left side of the chest; this pain was relieved by morphia. On the 26th there was dulness on percussion over the left side of the chest as high as the angle of the scapula, with bronchial breathing and bronchophony and decrease of the vocal fremitus—in short, all the signs of empyema. On the 27th preparations were made for aspiration, but finding on re-examination that hyper-resonance had replaced the dulness at the left scapular region Dr. Ewart decided not to aspirate. The occurrence of a limited pneumothorax was suspected, but as a careful examination showed that the heart was not displaced to the right an alternative diagnosis was made of bronchiectasis with sudden evacuation of the contents of the cavity. On the 28th the patient's cough was still very troublesome. He had orthopnœa; the cyanosis was more marked, the pulse very rapid, and the exhaustion extreme. The temperature was 102°. The apex beat was now distinctly displaced to the right, and could be felt in the fifth space one inch to the left of the sternum. Over the upper half of the left side of the chest, both front and back, there were hyper-resonance and loss of breath-sounds, but the lower part continued to be dull. The breath was very offensive, and there was urgent difficulty of breathing. Full confirmation having now been obtained for the diagnosis of gangrene of the lung rupturing into the left pleural cavity and giving rise to pyopneumothorax, Mr. Marmaduke Sheild was called in with a view to operation. Chloroform having been administered, an incision was made into the left pleural cavity through the sixth intercostal space immediately behind the mid-axillary line. A large amount of very fœtid pus and gas escaped and an empyema tube was inserted. At the end of the operation it was found that the heart's apex beat had returned to its normal position On the 29th, after a fair night, with very little cough and little expectoration, the patient's breathing was still rapid, but his general condition had much improved. On dressing the wound a large quantity of very fœtid pus came away. The amount of discharge steadily diminished, the fœtor became less marked, and he rapidly improved in health. On June 11th the wound, though not yet healed, was small, and from it came but a small quantity of pus, which had no unpleasant odour. Breath-sounds could be heard close up to the margin of the wound in front and above, and also posteriorly down to the level of the incision; but behind and below the breath-sounds were not audible, and this area was dull on percussion. The left side of the chest had noticeably fallen in.

Remarks by Dr. EWART.—The points of interest in this case were the patient's early age, healthy antecedents and surroundings, and the absence of any clue as to the source of infection or of septic influence; the changes in the physical signs, which led to the case being viewed in succession as one of broncho-pneumonia, of empyema, of bronchiectasis, and of gangrene with pneumothorax; the almost desperate condition of the patient at the time of the operation; and finally, the complete recovery, thanks to the latter.

[7] Journal Hebdomadaire de Médecine, 1830, vol. vii., p. 126.

Medical Societies.

KIDDERMINSTER MEDICAL SOCIETY.

Punctured Wound of Abdomen.—Exhibition of Cases and Specimens.

A MEETING of this society was held at the Kidderminster Infirmary on May 28th, Mr. S. STRETTON being in the chair.

Dr. THOMPSON sent notes of a case of Punctured Wound of the Abdomen with Prolapse of about eight inches of Bowel. The patient was a girl, aged four years, who was brought from the country four miles in a spring cart with the protruded bowel covered by a wet cloth. Chloroform was administered, the opening was enlarged, the wound was stitched up, and a pad and bandage were applied. The child was then driven home in heavy rain. She had no bad symptoms and made an uneventful recovery.

Mr. J. L. STRETTON showed a patient upon whom he had performed Cholecystenterostomy. The first part of the operation was performed, and the Murphy's button was passed on the fourteenth day. There was a considerable discharge of bile and fæces through the gall-bladder, to allay which it was plugged with iodoform gauze, when the discharge appeared to cease. The second operation was then performed. An elliptical incision, including the fistulous opening, was made; the edges of the opening were then freshened, and it was closed with deep sutures, the elliptical opening being brought together over it. The wound healed without any trouble, and the fæces now contained bile, which they had not done prior to operation, showing that there was some communication between the gall-bladder and intestine. Although in this case the operation had been divided, Mr. Stretton thought it would be better in future cases to perform it at one time for fear of the contraction of the newly formed opening.—Mr. STRETTON also showed Seven Calculi weighing sixty grains in the dry state removed from the urethra of a youth. Six of them were in the fossa navicularis faceted together, and were removed with urethral forceps.

Some few months later the seventh was found impacted in the bulbous urethra and was cut down upon.

Mr. J. P. HOLYOAKE and Mr. E. H. ADDENBROOKE also described cases of Urethral Calculi.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Treatment of Puerperal Septicæmia.—Exhibition of Specimens.

A MEETING of this society was held in the board room of the Medical School, Leeds, on May 27th, Mr. H. BRIGGS, President, being in the chair.

Dr. BRAITHWAITE (Leeds) contributed a paper on the Treatment of Puerperal Septicæmia, based upon sixty-three cases seen in the last eight years. In four cases he had used anti-streptococcic serum, and in three out of the four a considerable reduction of temperature followed, but it was uncertain how much of this was due to douching, purgatives, and other treatment. The serum should be employed at the onset of the fever.—A discussion followed, in which the PRESIDENT, Professor C. J. WRIGHT, Mr. CROFT, Mr. RICHARDSON, Dr. HELLIER, and Dr. GEMMELL took part.

Professor C. J. WRIGHT (Leeds) showed the following specimens: (1) Some Molar Masses removed from a Uterus four weeks after the birth of a living child; there had probably been a twin conception with one ovum blighted; the masses consisted of granulation tissue and contained a few bits of placental structure; and (2) the Placenta from a case of Triplets; this was one large placenta with two cords and a smaller one with one œdematous funis; the amniotic sacs were separate.

Mr. W. A. STOTT (Leeds) showed specimens of Carcinomatous Ovaries, Double Hydrosalpinx, and Double Pyosalpinx.

Mr. CROFT (Leeds) showed a Ruptured Female Bladder. The patient had been operated upon for hæmorrhoids; there was no subsequent retention of urine or catheterisation. On the eighth day there were abdominal pain and distension, followed by a diminution in the quantity of urine passed and symptoms of uræmia. The patient died from uræmia, and post mortem there was no evidence of peritonitis, adhesions, tubercle, or abscess in the pelvis or abdomen.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF STATE MEDICINE.

The Recent Failure of Hospital Accommodation in Dublin.

A MEETING of this section was held on May 10th, Dr. J. M. REDMOND, President, being in the chair.

Sir CHARLES CAMERON read a paper on the Recent Failure of Hospital Accommodation in Dublin. He mentioned that in 1895 he proposed the institution of a hospitals board for Dublin city and county on the lines of the London Asylums Board, and the scheme was approved of by several of the local authorities, particularly by the North Dublin Board of Guardians, but it was opposed by the council of the Dublin Sanitary Association and by the physicians of several of the Dublin hospitals. Three arguments were used against it: (1) that it would be enormously costly; (2) that there was ample accommodation for the treatment of infectious diseases in existing hospitals; and (3) that it would interfere with medical education. Sir Charles Cameron, however, argued that the existing hospital accommodation was last year proved to be quite insufficient, and that the scheme would, as alleged, seriously interfere with medical education seems improbable, for no one can deny that Edinburgh and Glasgow are medical schools of the first rank, and yet the students in those cities have to go to special fever hospitals to acquire a knowledge of contagious diseases. It is the same in London and other places. Last year when measles became epidemic in Dublin scarlet fever also was prevalent, and the severer cases of those diseases were so numerous that the hospitals were crowded with them. Very bad cases of measles and erysipelas had to be retained in tenements of the most wretched kind, as no hospital accommodation could be procured for them. At the period when the congestion of the hospitals had attained its maximum small-pox broke out on the south side of the city, and no hospital was in a position to admit the first three patients, but fortunately the disease did not spread. In any future epidemic of small-pox it would be desirable to have hospital accommodation outside the city. As regards measles there will always be a difficulty in providing accommodation for its victims on account of the great number of patients. In Glasgow a determination has recently been arrived at to provide full accommodation to meet the wants of the largest epidemic of this disease, and in Edinburgh the foundation-stone of a fever hospital has just been laid which will accommodate 600 patients, including measles cases. Sir Charles Cameron was, on the above grounds, still of opinion that an infectious diseases hospitals board should be constituted for the Dublin district, and that the board should establish a small hospital, a home for convalescents, and make provision for epidemics of measles or scarlet fever.

Dr. FALKINER said that the hospital accommodation in Dublin was quite insufficient in the event of three or four epidemics occurring at the same time. He considered that measles was not a disease which must spread broadcast of necessity.

Dr. J. W. MOORE strongly advocated an isolation hospital for small-pox, and thought it a disgrace that Dublin did not possess such a hospital.

Reviews and Notices of Books.

Practical Manual of Diseases of Women and Uterine Therapeutics for Students and Practitioners. By H. MACNAUGHTON-JONES, M.D., M.Ch., M.A.O. (*Honoris Causâ*) R.U.I., &c. Seventh Edition. Revised and enlarged, with 565 Illustrations. London: Baillière, Tindall, and Cox. 1897. Price 15*s*.

WE are told in the preface "that no previous issue of this work has undergone such complete revision and re-construction as the present one, both in the re-arrangement of the order in which the subject is dealt with, the numerous additions which have been made to the text, and in the large number of illustrations it contains." We observe that attention is called to a recent trial which "has shown how careful the operator and those assisting him should be to make no observation on the case while the patient is in the condition of semi-anæsthesia." The author has not apparently shaken himself entirely free from the teachings of the mechanical system of uterine pathology, so much in fashion twenty years or more ago, as version and flexion are retained on his list as causes of dysmenorrhœa, and a large number of pessaries, including intra-uterine stem pessaries, are still figured. Dr. Macnaughton-Jones advocates forcible dilatation of the sphincters under ether in obstinate constipation. He relates the following case:—

"A lady from —— consulted me for constipation ..... she had ever since [her confinement] been relieved by enemata and with difficulty. ..... On examination I found the uterus healthy and in its normal position, the rectum loaded and hæmorrhoidal. There was a vaginal leucorrhœa. The following day, under ether, I forcibly, with my hand, dilated the sphincters. A few fibres of the external were ruptured; the rectum was emptied of its contents. An olive oil enema was given the next morning. She was placed on cascara sagrada and a mild pill of belladonna and nux vomica, and from this to the day she left England, a period of four months, the bowel was regular, and she never used an enema."

It is not very easy to see what harm there would have been in trying the effect of the olive oil enema followed by cascara and the mild pill before stretching this patient's sphincters forcibly with the hand, especially as she was not leaving England till four months later, but no doubt the author had his own reasons for the course adopted.

We do not think the author describes Hegar's sign of pregnancy quite correctly. He says it consists in the

uterus losing its pear-shaped outline; "the body is bellied out over the cervix in all the transverse diameters, especially antero-posteriorly." This does not seem to be quite clear. Hegar's sign consists in the very marked softening that takes place during early pregnancy in the uterus at the level of the internal os. This softening is so marked in some cases that on bimanual examination the enlarged body of the uterus has at times actually been mistaken for a tumour separate from the uterus. We observe, by the way, that several proper names are spelt somewhat erratically, which we should not have expected in a seventh edition. Thus Dr. Herman appears several times as Dr. Hermann; Mr. Targett is particularly unfortunate, appearing as Dr. Taggert in the index and at p. 558, and as Mr. Torgert at p. 786; Budin appears twice as Buden; even Spiegelberg is given twice as Spiedelberg; and Paquelin given once at least as Pacquelin. Dr. Macnaughton-Jones still thinks that Sir John Williams's views on cancer of the cervix are not borne out "either by clinical experience or the pathological researches of others." We have rarely seen a book in which the quotations from the writings of other authors are so long and so numerous as in the one before us. As the author states that the book is intended for the student as well as for the practitioner we think it right to say that to our thinking the student knowing nothing of the subject wants something more dogmatic. Thus, at one place the author says he agrees in the main with the opinion expressed by Matthews Duncan in his lecture on "Minor Displacements," and yet he approves of dividing the cervix in some cases of anteflexion and figures a long array of pessaries, including eighteen or twenty figures of intra-uterine stems.

In the chapter on Uterine Displacements there is a long list of some results, direct and indirect, of uterine versions and flexions. Among the results are amenorrhœa, menorrhagia, and metrorrhagia, uterine fibroids, perimetritis, and pelvic phlegmon. The author in the preface claims that his book is an epitome of the teaching and opinions of the greatest living gynæcologists. We think the author is here mistaken to some extent; we do not believe there is a teacher of gynæcology at any one of the London medical schools who believes that, for instance, pelvic phlegmon, perimetritis and uterine fibroids are caused, directly or indirectly, by uterine versions or flexions. We are glad to see that total extirpation of the uterus for prolapse is not countenanced by the author. Although the danger in capable hands may not be great, yet we agree with the opinion he quotes, that "the danger of a surgical proceeding should be at least not greater than the danger to life of the condition which the operation is destined to cure." Among the more noticeable features of the book are the abstracts of the various methods of operating on uterine fibroids. Thus there are good descriptions of Doyen's panhysterectomy, and of Baer's operation among the operations that dispense with the clamp, and of Taylor's method of clamping the pedicle when the extra-peritoneal method is employed. Martin's description of his method of operating is also quoted, and is accompanied by his excellent illustrations, which originally appeared in the Transactions of the Obstetrical Society of Edinburgh. The process by which they have been reproduced has not brought them out quite so sharp as the original figures, but they are clear enough to follow. The chapter on tubal pregnancy, short but remarkably clear, has been revised by Mr. Bland Sutton, and is in every way excellent. There is an extremely large number of formulæ for lotions, medicines, and applications scattered through the book, which will probably form an attractive feature, and there is also a large number of suggestions on the important matter of treatment. There is, too, a useful list of the principal foreign and home spas, with a note of the chief characters of the waters at each.

There is now such a large number of operations, major and minor, in gynæcological practice that it is convenient to have descriptions of them under one cover for reference. We think that there are very few of these operations to which some reference will not be found in the book before us.

DR. RENTOUL'S MIDWIFERY NURSES' REGISTRATION BILL.

DR. R. R. RENTOUL deserves commendation for his unwearied efforts to arrive at a satisfactory solution of the midwives question, but he has not arrived there yet.

The subject is one in which the medical profession is interested in a variety of ways, and the opinions of representative medical men will no doubt influence the action of politicians in shaping the legislative measures which have become inevitable. Dr. Rentoul's draft Bill is entitled, "An Act to Provide for the Training, Compulsory Registration, and Supervision of Midwifery Nurses." The object of the Bill, which is to be applicable to the United Kingdom of Great Britain and Ireland, is to protect the general public, and especially its more uneducated members, so that they may know who are trained midwifery nurses. The Bill does not make it illegal for any woman to help another in a friendly manner, neither does it interfere in any way with existing midwives, but it would put a stop to the holding of examinations and the granting of documents which profess to entitle women to call themselves midwives and to act as such. The leading features of the draft Bill are—(1) the special appropriation of the term "midwifery nurse," with heavy penalties for infringement; and (2) the creation of a "divisional midwifery nurses' board" in each of the three divisions of the United Kingdom. The "midwifery nurse" is defined as "a woman who acts, or is entitled to act, as a midwifery nurse in *all* cases of labour under the direct supervision of a registered medical practitioner, and who nurses mothers and infants under such regulations as are laid down in this Act, or which shall be from time to time laid down by the divisional midwifery nurses' boards." The principal rights and privileges conferred on her, as well as the disabilities and penalties to which she may become liable are as follows: "No person, except such as are registered under this Act, shall be entitled to take or use the name or designation of midwifery nurse, either alone or in combination with any other word or words or letters, or any name, designation, word, addition, or description implying that such person is registered under this Act," the penalty for infringement hereof being liability to "a fine not exceeding £10 for the first offence and £20 for the second or subsequent offence, and to imprisonment until such fine be paid."..... "No person unless registered under this Act shall act as a midwifery nurse in any hospital, infirmary, dispensary ..... or under the supervision or control of any registered medical practitioner." ..... "No person shall be entitled to privately ask for or receive or recover any wages or charge in any court of law for services rendered as a midwifery nurse unless such person is registered under this Act." ..... A certificate of registration under this Act does not render its holder "entitled to grant any certificate of the fact or cause of death, or a certificate of the cause or fact of stillbirth, or any medical certificate. Any person contravening the terms of this Section shall be liable to a fine not exceeding £20 and all costs of suit." ..... "No person shall be granted a certificate of registration to act as a nurse whose age is under twenty-five or over sixty years." ..... "A certificate of training in the duties of a nurse shall not be accepted by the divisional board or committee of examiners unless such lectures or training have been given by a registered medical practitioner." ..... "The period of training ..... shall not be less than six months or more than twelve months." ..... "If any nurse shall conduct any confinement upon her sole responsibility, or shall keep in her possession or use any midwifery forceps, sound, perforator, or any other appliance or instrument or drug, or shall upon her sole responsibility administer any drug to any woman or infant she shall be liable to be censured or suspended or fined or have her name removed by the board from the register." ..... "If any

nurse shall keep any shop or place for the supply or sale of drugs of any kind her name ..... shall be removed from the register."

Dr. Rentoul proposes to establish in each of the three divisions of the United Kingdom a "Divisional Midwifery Nurses' Board," for the purpose of appointing committees of examiners, keeping registers, &c., the board in England and Wales to consist of eleven medical practitioners, and those in Scotland and Ireland of eight each. The divisional boards are to be elected every fifth year, one member being chosen by each of the six Royal Colleges, one by each of the three Local Government Boards, three members in England and Wales, and one each in Scotland and Ireland by the medical staffs of voluntary lying-in hospitals specified in an annexed schedule, five in England and Wales, and four each in Scotland and Ireland by the registered medical practitioners engaged in practice. "Each divisional board shall be constituted and shall hold its first meeting ..... in such time and place as the President of the General Medical Council shall appoint, and shall draw up regulations as to the time and place of the meetings of the divisional boards and such other regulations as are provided for in this Act, and shall submit such regulations for approval or otherwise to the General Medical Council and to the Privy Council." ..... "The regulations for the guidance of boards shall be drawn up by the divisional boards ..... and may from time to time be revoked, altered, or amended. The same uniform regulations shall apply to each and all of the boards. The regulations so drawn up or amended shall be forwarded to the General Medical Council and to the Privy Council to be approved of or otherwise. ..... The regulations shall be framed in such manner as to secure in each part of the United Kingdom one uniform standard as regards the period of training, the subjects of training, age of entry for examination, conduct of examinations, conduct of registered midwifery nurses, and of all such subjects coming under the notice and authority of each divisional board. Provided that the course of instruction and of examination of candidates for the certificate of registration as midwifery nurse shall not include the theory or practice of medicine, or of surgery, or of midwifery, or of pharmacy, or of dentistry, or any part or branch of these subjects. Provided, also, that if any nurse shall obtain any authority to practise pharmacy or dentistry, or any branch of medicine, surgery, or midwifery, she shall cease to have her name registered on the midwifery nurses register and to act as a midwifery nurse." ..... The board for England and Wales shall each year appoint three committees of examiners, who must be registered medical practitioners, to hold examinations in three different parts of England and Wales; the boards for Scotland and for Ireland shall in like manner appoint two similar committees to examine in two different parts of their respective countries. Each committee shall consist of two persons exclusive of the chairman, and shall meet as often as may be directed by its board. "There shall be paid to the divisional board by each woman who presents herself for examination a fee of £1, half this sum to be charged if she fails in one examination and presents herself for a subsequent examination. The original registration fee for each person registered shall be £1, inclusive of the annual registration fee." ..... "From and after the date of the passing of this Act no person or persons or company or body of persons, or any authority or body now holding any examination or granting any document ..... shall hold any examination or grant any certificate or document which professes to empower any person to act as a midwifery nurse, except as provided in this Act, under a penalty for each such offence of not less than £100, and no person or persons shall ..... hold any examination or grant any document which professes to entitle any person to act as a midwife under a penalty for each such offence of £50, any Act of Parliament or charter or regulation to the contrary notwithstanding. Nothing in this Act contained shall ..... in any way affect the occupation of any woman who at the time of the passing of this Act acts or possesses a certificate which professes to entitle such woman to act as a midwife." ..... "The secretary of each examining committee shall ..... transmit a list of the names of the successful candidates to the divisional board ..... and the registrar ..... shall on receiving the registration fee from the nurse forward to her at her address a certificate of registration." ..... "Every nurse shall each year ..... obtain from the divisional registrar ..... a certificate of registration," the fee for which annual certificate shall be 3*s.* 6*d.* "A midwifery nurse shall within one month of her settling in a district to act as nurse, and in every succeeding year, take or send her certificate of registration to the clerk of the local sanitary authority of the district in which she purposes to act as nurse. The clerk shall keep a written alphabetically-arranged list of the names of such nurses, with their addresses. ..... No fee shall be charged to such nurse for showing her certificate of registration to the clerk. The list of the names and addresses of such nurses shall be open for the inspection of any person during the hours at which the office of the clerk is open, and no fee shall be charged for such inspection. Certified copies of such list of nurses shall be forwarded each year by the clerk of each local sanitary authority in the United Kingdom to the divisional board of that division of the kingdom in which the sanitary authority is situated."

The above extracts, which are not given exactly in the order in which they appear in the draft Bill, sufficiently indicate its essential features. It fills nine printed foolscap pages, not including the Memorandum, the Arrangement of Clauses, and the Schedules. There are various clauses relative to offences of sundry kinds, and among them it is provided that if any registered medical practitioner shall wilfully or knowingly employ any registered midwifery nurse to perform any duties other than those laid down or provided for in this Act complaint may be made to the General Medical Council, which may strike him off the Medical Register for two years. The proposal most difficult of comprehension is Clause 9 (1) (*g*) already quoted, which provides "that the course of instruction and of examination of candidates for the certificate of registration as midwifery nurse shall not include the theory or practice of medicine or of surgery or of midwifery." No provision seems to be made for midwifery practice apart from, or in the absence of, a medical practitioner, neither is there any indication of the means which it is proposed to adopt for the discovery and prosecution of offenders. Prosecutions by medical men, whether as individuals or associations, would obviously be unadvisable from every point of view. It is probable that the quinquennial elections of direct representatives to the divisional boards would excite anything but enthusiasm among the electors; but whatever modifications in details may be subsequently introduced, there is no denying the soundness of the general principle that this important branch of medical practice ought to be retained under adequate medical supervision.

THE SOCIETY OF CHARTERED NURSES.—Her Royal Highness the Princess Christian has graciously consented to become the President of the Society of Chartered Nurses, 24, Princes-street, Cavendish-square, W. This society was founded to supply to the public thoroughly competent private nurses. It is under the management of a professional committee, and being conducted on coöperative principles secures to each nurse the full remuneration of her work.

PRESENTATIONS TO MEDICAL MEN.—Mr. H. M. Page, M.D. Brux., M.R.C.S. Eng., D.P.H. Camb., of Redditch, has been presented with a silk umbrella by the Midland Railway Company's Redditch Ambulance Class in recognition of services rendered as lecturer; he has also received a dressing-case from members of the police force.—Mr. James Atkinson, L.R.C.P. Edin., M.R.C.S. Eng., of Crewe, has been presented with an instrument bag by the railway workmen on the Crewe works as an acknowledgment of instruction given to the local ambulance class.—Mr. S. Andrews, L.R.C.P. Lond., M.R.C.S. Eng., of Basingstoke, has received from the local ambulance class a silver-mounted surgical case (containing a hypodermic syringe, &c.), with inscription.—Mr. Geo. H. Johnson, L.R.C.P. Edin., M.R.C.S., of Teignmouth, has been presented with a pocket barometer by the local ambulance class in recognition of services rendered as instructor.—On May 28th the members of the Pride of Cornwall Lodge of Oddfellows presented Mr. Charles W. Chubb, M.R.C.S. Eng., L.S.A., of Torpoint, Cornwall, with a handsome silver tea urn, inscribed as follows: "Presented to C. W. Chubb, Esq., as a token of respect and esteem from the members of the Pride of Cornwall Lodge, M.U. I.O.O.F., Torpoint, on his resignation after fifty-one years' connexion as surgeon." The juvenile members of the society gave Mr. Chubb a claret-jug and a walking-stick.

VICTORIAE

REGINAE ET IMPERATRICI

Per annos sexaginta Res Britannicas feliciter gerenti Salutem plurimam dicunt Medicinam Profitentes.

οὐκ ἀγαθὸν πολυκοιρανίη εἷς κοίρανος ἔστω,
εἷς βασιλευς.—HOM. Il. II. 204.

"Semper honos nomenque tuum laudesque manebunt."—VIRG. Æn. I. 609.

Quo fonte virtus, quo fluat imperi
Splendor Britannis, Pieri, nos doce
Quae cuncta despectas ab ortu
Solis ad Hesperium cubile,

Quae claustra calles rumpere temporis
Parvasque nostrae primitias rei
Ostendere et vinctos Latinis
Compedibus Silures ducemque

Pro Claudiana sede Caractacum
Fatis resolventem ora:—"Quiritibus
Non usque durabit superbum
Imperium neque semper Urbi,

Ex aede celsa prospiciet Pater
Ultorve Mavors: saecula quattuor
Labentur et 'Rerum Magistra'
Barbaricae imminuetur Arcto.

Nam per Columnas Herculis ultimos
Cursus Ulixes dum tenet, Insulas
Visum Beatorum, ad Britannos
Devehitur, neque inhospitali

Usus tyranno, reddit aquis suos
Secum refectos, non animo sine
Grato futurorumque nostrae
Nuntius Albioni bonorum,

Quam fatur olim magnanimûm fore
Matrem virorum, duplicis imperi
Largam, subacturamque tercas
Et maria Æneadis negata,

Donec ruinis altior Italis
Staret suprema, et Dis melioribus
REGINA et, informata fungi
Plus vice Caesarea, IMPERATRIX."

Quae fert Britannis rex Ithacensium
Romaeque prodit fata Caractacus
Non creditura, quam probata,
Quam fuerint rata dicat Orbis:—

Dicant triumphi pacis et ingeni
Humanioris, partaque civibus
Cum lege libertas, et alma
Religio genetrix Salutis:

Dicant et artes muneraque indolis
Carae Camenis, seu lapidi datur
Vis viva, seu pictis tabellis
Eloquium, geniusve libris:

Dicant paternae provida Curiae
Consulta, et imis aequa reis Fora, et
Ordo Sacerdotum verendus
Rite gerens Cruce se minorem.

Testes tot inter nec comitem abneget
Mens Æsculapi, militis unice
Pugnacis et nacti tropaea
Non ducibus data bellicosis;

Quo civitatem quis status adjuvet
Curante, pestes inque aciem cohors
Producta causarum facessunt,
Terga vel ante tubas daturae;

Qui sopit aegros rore per halitum
Donante lethen, ne metuant pati
Ferrum quod admorit severum
Vimque salutiferam Machaon;

Qui cultor audens nec tamen impius
Rerum parentis scit penetralia
Intrare vitae non profanis
Luminibus prius haurienda,

Morbumque in antris opprimere intimis,
Ut dormientem Protea, mox sua
Consilia aperturum, quot arma
Ludere, quot soleat timere,

Mos unde nobis normaque sanior
Deducta firment et genus et domos
Dum major integremur aetas
Inque vetus referamur aurum.

Princeps ter alma et tot sata regibus
VICTORIA! Orbi praebita, ceu redux
Astraea, et adscribenda caelo,—
Sera tuis abeas alumnis!

Praesentiori numine nam tuo
Fortuna nobis defluet amplior
Illi propinquatura metae
Usque pias animis petitae,

Quo cum mearint, verius Insulas
Visent Beatas quam vagus Hercules,
Audax Atlanteas per undas
Hesperidum rapuisse poma.

J. P. STEELE,
M.D. EDIN.

Badae Helvetiorum
Id. Jun. MDCCCXCVII.

ARGUMENT.—The Muse of History, invoked to reveal the origin of Britain's greatness, recounts the Claudian subjugation of the Silures and the prophetic discourse of their chief, Caractacus, before the Emperor's tribunal. In four centuries from that date Rome will succumb to the Barbarian North, for (adds Caractacus) Ulysses in his last voyage in quest of the Happy Isles, being storm-stayed on the British coast, was hospitably entertained, and, in return, predicted the future power and expansion of his host's till, under a "QUEEN and EMPRESS," they would rule a world wider than that of Rome, purer in religion, and more civilised. How far that propheey, recalled from the grey foretime by Caractacus, has been fulfilled let the contemporary world attest by the triumphs of peace, of liberty under law, and of Christianity; by the fine arts—sculpture, painting, literature; by the Senate, the courts of Equity, and the Church; but not least by the triumphs of the Healing Art, as seen in State Hygiene, in painless Obstetrics and Surgery, in the treasure-trove of Physiology and Pathology, giving the key to the inmost recesses of the human organism, surprising latent Disease like the sleeping Proteus, and forcing it to give up its secrets as to the cause, the course, and the cure of suffering. To the advance of Medicine there is no bound, accelerated as it is by the enlightened sway of the QUEEN and EMPRESS in the character of "Astraea Redux." May that blessed sway continue! The true "Islands of the Blest." J. P. S.

THE LANCET.

LONDON: SATURDAY, JUNE 19, 1897.

1837. MEDICINE AND THE MEDICAL MAN. 1897.

To tell the story of the progress of medicine during HER MAJESTY'S splendid reign—a reign not only unprecedented in length but in scientific discovery and development of all sorts—would be manifestly impossible within the scope of the editorial statement of a weekly journal. Space will not allow us to enter into detail when a period of sixty years, no year of which has been barren of result, has to be covered. A mere list of the names of men whose life-work has added to the stores of our special knowledge could with difficulty be compressed into the scope of this article if the list were to be exhaustive and to include all whose work directly or indirectly has conduced to the advance of scientific medicine. For as medicine has been metamorphosed from an art into a science the taxes which she levies upon the sister sciences have grown heavier and heavier, until the present position is reached, where the surgeon's aptest assistant is applied chemico-physiological procedure of the most elaborate sort, and where the physician displays the single-heartedness of his studies by employing in his therapeutics an accurate knowledge of electrical phenomena. In the brief account of medical progress during the past sixty years which now follows we have attempted to call attention to the most important steps forward. And we are justly proud of being able to say that if anyone should desire to know more of particular circumstances in this grand record of advance he can consult our columns in the past. For THE LANCET was born fourteen years before HER GRACIOUS MAJESTY ascended the throne, and within its covers will be found the true and exhaustive history of medical progress during the reign.

We start our summary with a brief *résumé* of the advances in our knowledge of physiology and chemistry, for to the enormous strides that these sciences have taken we must attribute much of the success that attends medical practice of the present day. In diagnosis, in prophylaxis, and in therapy alike our methods are now based upon scientific research. But let no one look with anything but respect on the great men of the past whose labours were effected under a less favourable environment. In the "thirties" and "forties" there were giants in the land, and the work that they did has been of incalculable value. Advances in the ancillary sciences could not have been grafted with success upon an empirical scheme. It is because the old work was good and honest and thorough—it is because when true reasons for procedure were absent false reasons were never invented—that medical routine was in a healthy condition and ready to take advantage of all tribute brought to it from exoteric sources. We are sure that no one can read the names of the heroes of medicine in the early Victorian days without feeling that a debt of gratitude and reverence is owing to them, for their technical knowledge, for their intuition, and for their honourable methods.

THE GROWTH OF PHYSIOLOGICAL AND BIOLOGICAL KNOWLEDGE.

To give even a short account of the advances that have been made in physiology and in physiological chemistry during the past sixty years would require a volume. The doctrine of the correlation of forces and the doctrine of evolution have profoundly modified our conceptions of the nature of life and of the secondary causes which have led to origin and diversity of the forms of life by which we are surrounded. We can hardly place ourselves in the position occupied by workers before DARWIN'S revelations and HUXLEY'S magnificent support of them. For the relations of HUXLEY to DARWIN—with LISTER and PASTEUR the foremost scientific names of the Victorian era—are deeply interesting. Without HUXLEY'S powerful aid, valuable corroborative evidence, and telling exposition of the doctrines of evolution DARWIN'S views would certainly have been far more slowly accepted.

PROFESSOR HUXLEY.

The importance of the cell as the physiological unit common to all the tissues of the body has been fully established, though the estimation of the relative value of its component parts—cell-wall, protoplasm, and nucleus—has of late years undergone material modification, whilst each has been shown to possess a structure far more complex than was believed to exist by the originators of the cell theory, SCHLEIDEN and SCHWANN, or even by VIRCHOW, who twenty years later so ably supported the doctrine of "omnis cellula e cellulâ." The successive improvements made in the construction of the microscope have proved of immense service to physiology by enabling observers to comprehend the structure of the different organs of the body, and thus to gain some insight into the mechanism by which the various functions of secretion, sensation, and motion are effected. We are still only on the threshold of this inquiry and are

very far from comprehending the mode in which this mechanism acts; but the little knowledge that has been gained has served to sweep away much that was inaccurate and even absurd in the opinions and practice of our immediate predecessors, and to establish better, because more rational, methods of treatment of disease.

Experimental physiology dates back to the time of GALEN, and a few names, like those of HARVEY and HALES, stand out in strong relief as experimentalists in the period of revival from the long sleep of science during the Middle Ages; but at no time has it been pursued so energetically as in the last few decades, or with more instructive and satisfactory results. In France the mantle of a great experimentalist, MAGENDIE, fell on the shoulders of a still more successful investigator, CLAUDE BERNARD, to whom physiology is indebted for some of the most striking discoveries of this period. His lectures delivered before the Collège de France or read before the Académie des Sciences were a succession of surprises. Now it was the effects upon the several constituents of food of the different fluids poured into the alimentary canal, the salivary, gastric, biliary, pancreatic, and intestinal juices; now it was a novel function of the liver in the production of sugar; now the action of the sympathetic system on the production of heat, or the effects of various toxic agents as curara and strychnia on nerve and muscle. Subsequent research and the keen criticism of acute observers in other countries have modified some of his results, but the originality and ingenuity of his experiments command admiration, and he must always be regarded as one of the foremost men of his time. The mode of teaching adopted by LUDWIG in Vienna also gave a great impulse to the study of experimental physiology, for he not only did much original work, but he founded a school; in many instances he suggested the subject to be investigated to his pupils, pointed out the mode in which it should be attacked, supplied all necessary apparatus, assisted the student when requisite with his practised eye and hand, and whilst leaving him to take the notes finally put the whole into due order; then with infinite good nature he allowed the young experimenter to publish the results in his own name, so that the initiated alone knew how much was due to the master, thus creating a debt of gratitude which none of his pupils thought could be overpaid. Following the same lines MICHAEL FOSTER established a school of young physiologists at Cambridge, and the work they have accomplished, as recorded in the *Journal of Physiology*, will bear comparison with any of the great continental schools.

It is of small importance what section of physiology is selected to illustrate the immense advances that have been made by the combined labours of numerous painstaking and accurate observers in many different countries. The blood has not been the subject of more research than nerve or glandular structures, yet it is easy to show that our knowledge has been rendered far more exact of late years in regard to the form, size, and number of the corpuscles; of the relative proportions of the coloured and uncoloured, of the spontaneous movements of the latter, and of their ability traverse the walls of the vessels; of the origin of the coloured corpuscles and the effects of reagents upon them, of their chemical composition, and of the nature, quality, and exchange of gases during their passage through the capillaries of the lungs and those of the tissues; while such points as the crystallisation of the hæmoglobin and the phenomena of spectrum analysis are altogether of recent date. More striking still are the accessions to our former knowledge of the phenomena that can be demonstrated in the nervo-muscular apparatus. The form and speed of the ave of contraction in muscle, the rapidity with which the impulses causing sensation and motion are propagated in nerve, the functions of the several columns of the spinal cord, the long denied reaction of the brain cortex to stimulation, have been rendered probable or actually demonstrated by the converging and mutually supporting lines of careful dissection, microscopic examination, experimental and pathological inquiry, and embryological research, whilst comparative anatomy has now and again afforded additional evidence when proof from other sources was wanting.

Of late years the physiological chemist has been persistently engaged in the investigation of the changes undergone by the proximate principles of food—as starch, sugar, fat, and proteids—not only in the alimentary canal, where the first steps in their assimilation are accomplished, but in their passage through the economy, until they are discharged either partially oxidised in the form of urea, lactic, uric, and hippuric acids, creatinin, and the like, or completely burnt in the form of water and carbon dioxide. Great progress has been made in the discovery of the primary changes that occur, such as the origin of sugar from amyloid substances, the emulsification and saponification of fats, the production of peptones from proteids with the subsequent formation of leucin and tyrosin, the aromatic compounds (indol, phenol, and skatol), and others, but many of the more recondite changes in the blood and in the tissues still await explanation. There is every reason to anticipate that such explanations will be forthcoming, and that in process of time we shall know all the intermediate changes. In several Continental universities, departments or laboratories have been instituted where physiological chemistry can be taught and pursued, and where problems hitherto regarded as insoluble are persistently attacked with good hope of success.

The physiological researches of PASTEUR, applied to medicine and surgery by LISTER, have borne magnificent fruit, more particular reference to which will properly follow.

CHEMISTRY IN RELATION TO THERAPEUTICS.

To record the progress of chemistry during the last six decades would be equivalent to writing a complete history of its evolution. Chemistry, in short, was born in the Victorian era, and grew with a pace second to no other branch of inquiry. This enormous progress has had a remarkable influence upon the growth of medical knowledge, and without chemistry medicine could not have taken the high position it now occupies as the healing science rather than the healing art. Medicine has gained a marvellous stimulus from the discovery of synthetical methods. The artificial building up of complex compounds from simpler ones, or from the elements themselves, has proved chemistry to be one of the most useful and faithful servants in the cause of medical knowledge and advance. By this we do not mean simply that synthesis has given to the physician a list of valuable remedies—as antipyretics, hypnotics, or what may be regarded as quinine substitutes (although this is a fact of extreme importance) but rather that by means of synthesis we have been led to a better understanding, and, indeed, in many cases to an exact knowledge, of the constitution or structure of remedies. This knowledge as it grows promises to place pharmacology upon a really scientific basis. If we are not wrong, the therapy of drugs will, perhaps before long, resolve itself into a question of chemical structure. The practitioner endued with the knowledge of what the specific remedial requirements of his patient are, will be enabled to minister to those requirements by adding or omitting, so to speak, groups or radicals in the compound which are or are not requisite in the case before him. It cannot be doubted that the specific therapeutic action of a drug depends not on its composition, but on its constitution, and the more we find out about the chemical structure of remedies the more satisfactory will be their administration.

As our readers probably remember, the first important

synthesis was effected by WÖHLER some ten years before the QUEEN came to the throne. It was the synthesis of urea, which for ever destroyed the idea that the so-called organic compounds could only be built up by the life processes in the plant or animal organism. Later, FRANKLAND announced the successful synthesis of certain hydrocarbons, while recently sugar has been built up practically from its elements by FISCHER. The synthesis of conine also has been effected by LADENBURG, the first step towards the artificial preparation of that important group of bodies in medicine, the alkaloids. The modern synthetic list, however, is a never-ending one. Take, for instance, the numerous antiseptics derived from coal tar, the preparation of which would never have been suggested without a knowledge of the architecture of molecules! Antiseptic treatment is one of the medical triumphs of the Victorian era, and it was chemistry that placed these agents of healing in LISTER'S hands. The vegetable colouring matters are now prepared in the laboratory of the chemist, who, by his acumen and observation, has forestalled nature in her wonderful building-up processes. Imagine, again, life in this Jubilee year without the colours which coal-tar chemistry has placed at our disposal. It is pretty safe to say that the historical pageant on Tuesday next will owe its brilliance in a very large measure to the beautiful series of colours which the inquisitive chemist has prepared from coal tar. The colours in the procession and in the decorations will afford a striking piece of evidence of the triumphs of chemistry achieved during the QUEEN'S reign. It was in 1856 that an English chemist, PERKIN, who is still among us, prepared the first aniline dye—namely, mauveine. Then followed a crop of discoveries resulting in the wide and beautiful series of aniline colours with which we are all now familiar. From the same source (coal tar) has been derived the long list of modern remedies which are mainly of the antipyretic and antiseptic class. It is interesting to recall the fact that carbolic acid, the first antiseptic, was discovered in tar but three years before the QUEEN came to the throne. The existence of this antiseptic in coal tar led to further investigation with the happiest results. From carbolic acid was obtained by a very simple process salicylic acid, which previously was only to be obtained from natural sources, chiefly in the oil of wintergreen. Synthetic compounds, however, need to be prepared with the utmost care in order to be "physiologically pure."

Within comparatively recent years it has been established that the microbe performs the great double function in nature of both analysis and synthesis. The important bearing of this fact upon the history of disease is now one of the most remarkable acceptances of the Victorian era. The work of PASTEUR is referred to in other columns, but it may here be pointed out that PASTEUR was a chemist. His work bore on the important study of the nature of the putrefactive and fermentative processes. In both these vital processes he found that organisms were at work re-arranging the compounds presented to them and evolving sometimes simpler and sometimes more complex bodies. In putrefaction definite products now known as ptomaines, which in constitution resemble the alkaloids, were recognised. In an analogous way the products of the life processes of bacteria are now known to be the direct cause of disturbance in the economy, giving rise to the manifestations of a specific disease. The importance of bacteriology in the etiology of disease is now fully established, and it remains to be remembered that chemistry cleared the way and opened up this field of study.

Lastly, we may recall the improvements that have been effected both in the preparation and in the form of administration of drugs, improvements depending largely upon chemical advance which have secured for the practitioner an economy and an accuracy in prescribing which two decades ago were quite unknown. This alone is worthy of emphasis as one of the marked features in the progress of administrative medicine during the Victorian reign, and taken in conjunction with what we have said before as to the possible development of an application of accurate chemistry to dosage and even choice of remedy, suggests a forecast that the debt of the physician to the chemist will continue to grow larger. When again there is recorded the history of sixty years of medical achievement we believe that the teachings of chemistry will have to be still further acknowledged in throwing light upon the action of remedies, and it is reasonable to hope that the knowledge of the constitution of remedies will have become so advanced by that time as to place therapeutics on a more exact, because less empirical, basis.

THE RISE OF BACTERIOLOGY: SERUM PATHOLOGY.

TO recount the progress of Bacteriology during the last sixty years would be to write practically the whole history of this branch of medical science. Before 1837 there were only a few isolated observations by LOEWENHOECK, SPALLANZANI, and SCHWANN, the latter of whom proved that the agent which brought about fermentation was a something in the air which could be destroyed by heat. Early in the reign further observations were made by HELMHOLTZ, HENLE, and others who enunciated the germ theory of disease. But the science was only laid on a firm foundation by the philosophic genius of PASTEUR, who investigated the subject of fermentation by yeast and then that of putrefaction. He showed by perfectly devised experiments that both processes were directly due to the growth of organisms which were present in the air, and that putrefaction could be indefinitely postponed if these organisms were prevented from entering the vessel in which the fluids were contained. The confirmation of these observations by a host of observers, prominent among whom were TYNDALL and LISTER in this country, gave the death-blow to the doctrine of spontaneous generation. PASTEUR also echoed HENLE'S prediction that all forms of contagious disease would ultimately prove to be due to specific organisms.

Shortly after this, in 1865, DAVAINE announced the discovery of the bacillus anthracis in the blood of animals suffering from splenic fever, and PASTEUR demonstrated that a disease among silkworms, which was threatening to destroy the silk industry, was due to an organism, and proved that by recognising the organism under the microscope and destroying the infected moths and their eggs the plague could be stamped out. Meanwhile, KOCH had been making his brilliant observations on the life-history of bacilli and the mode of obtaining pure cultures. His methods, particularly his plan of obtaining solid media, by adding gelatin to the broth, were eagerly adopted by a host of investigators, and these methods, and his criteria for deciding whether an organism found in connexion with a particular disease is the actual cause or not, are to this day those on which all observers rely. The name of KOCH will ever be remembered with that of PASTEUR as making possible the great work which has been done all over the world since their early investigations. Stimulated by the profound and philosophic teaching of PASTEUR, and by the exquisite methods of investigation brought to perfection by KOCH and his pupils, numerous pathologists in all countries at once set about the quest for the germs responsible for the various forms of disease, and for those which excite specific sorts of inflammation, and discovery after discovery rewarded their efforts. Those which have had the most practical result have been the discovery by KOCH of the tubercle bacillus, and later of the cholera bacillus; that by EBERTH of the bacillus of typhoid fever; that of diphtheria by KLEBS and LÖFFLER; and the

discovery of the plague bacillus by YERSIN. Not only has this work changed our views of the pathology of many of these diseases, but it has thrown unexpected light on the best ways of preventing their occurrence, and has been the chief cause of the importance that the subject—that of preventive medicine, hardly thought of in the pre-Victorian days—takes at the present time. Foremost among preventive measures was the introduction of "antiseptic surgery" by LISTER, who grasped the significance of PASTEUR'S teaching that septic processes were due to organisms derived from the air, and set himself to devise means whereby to exclude the organisms from

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wounds during an operation, and also to prevent them from finding an entrance after a dressing was applied. The system did not spring into existence in a perfect state, and has undergone much modification in details of procedure since it was first brought into notice by LISTER. But the principles have remained unshaken, and have revolutionised surgical procedure, and so reduced the mortality and pain following an operation, just as anæsthetics have abolished suffering under the knife, that the terrors of surgery have been reduced to a minimum.

Not only has the study of bacteriology led to the prevention of disease, but it has also given us new and unexpected means of dealing with infective diseases, even when they have manifested themselves for some time. The first observations on this point were almost the result of an accident. PASTEUR found that the contents of a flask containing a culture of the chicken-cholera bacillus were innocuous when injected into fowls, but, to his surprise, when he injected a fresh virulent culture into these same animals he found that they were proof against the virus. Starting from this observation he laboured until by similar methods he had obtained from cultures of the anthrax bacillus a "vaccine" which has been the means of protecting thousands of sheep in France from this destructive malady. Recently similar methods have been employed by HAFFKINE to obtain a "vaccine" against cholera, and although sufficient time has not elapsed for an adequately extensive trial of the method to establish its value, the results appear to be highly promising; moreover, during the last few weeks HAFFKINE has reported the result of some inoculations in cases of plague with a "vaccine" obtained from a culture of YERSIN'S plague bacillus in ghee, the bacillus being killed by heat before inoculation. Later PASTEUR found that the virulence of a culture might be modified by various external conditions, notably by the temperature at which growth takes place, so that, if injected into an animal, while not causing an attack of the disease, it may protect against a subsequent inoculation; or may mitigate or arrest an attack even if it is not injected for some time after a virulent culture has been introduced. In this way he obtained a "vaccine" for inoculating persons who had been bitten by animals suffering from rabies, and though not an absolute safeguard it has greatly reduced the mortality from that terrible disease—hydrophobia.

In 1890 a great advance was made when it was discovered by BEHRING and KITASATO that antidotal substances, or antitoxins, could not only be produced in vessels in the laboratory, but could also be obtained in large quantities under certain circumstances in the serum of living animals. They found, in the case of the tetanus bacillus, that if a virulent culture were injected into animals which were not susceptible to tetanus, the serum of their blood had the power of neutralising the effect of a virulent dose of the poison in a susceptible animal, even after the symptoms of the disease were well established. An animal of the same species not so protected infallibly died from tetanus. In many cases this treatment has been employed towards patients suffering from tetanus, often with the happiest results. Similarly it was found that the introduction of a culture of the diphtheria bacillus into the veins of a horse, which is insusceptible to the disease, is followed by the formation of an antitoxin which can be obtained after an interval in the serum and injected without risk into the subcutaneous tissues of human subjects suffering from this serious complaint. Moreover, it has been found possible to standardise the serum so that we can prescribe the dose of antitoxin almost as accurately as that of an ordinary drug, this advance being fully chronicled in the report of THE LANCET Special Commission on the Relative Strengths of Diphtheria Antitoxic Serums.[1] It appears probable that we are only dwellers on the threshold in our application of this method to the treatment of disease.

A serum prepared from the pneumococcus has been employed in cases of pneumonia, and in several cases the painful and dangerous form of septic poisoning acquired through a "post-mortem wound" has been at once relieved by the injection of a serum prepared from the inoculation of streptococci into an immune animal. It is probable that before the end of the century we shall be in the possession of an antitoxin for the various manifestations of tubercle, while it is possible that this method will have a wider application than the relief merely of diseases due to an organised virus, as it has been shown that an antitoxin can be obtained by exactly similar methods against serpent venom and the vegetable poison "abrin." Enough has been said to show what powerful agents for the treatment of disease have been put into our hands through the study of bacteriology, but it must not be forgotten that bacteriological methods have been of the greatest value in the clinical investigation of individual cases. The recognition of the bacillus of tubercle or of diphtheria, for example, may reveal the nature of a case and lead to successful treatment. Carrying the uses of bacteriology in diagnosis further, we have the reaction which ensues when the products of the growth of bacilli, such as tuberculin and mallein, are injected. Here we have, especially in the case of horses and cattle, the most precise indications as to whether the animals are the subject of tuberculosis

[1] THE LANCET, July 18th, 1896.

or glanders or not. More recently the reaction of the blood, or of the serum, of a patient suffering from typhoid fever, promises to be of great value in clearing up the diagnosis of doubtful cases, while it opens up quite a new branch of inquiry. We refer, of course, to WIDAL'S serum test.

The field is an enormous one, and the harvest already reaped great beyond all expectation, but it is probable that the science of bacteriology is only in its infancy, and that those who live to see it arrive at maturity will witness greater results than we at the present day can possibly conceive.

THE ADVANCE IN ANATOMICAL LITERATURE.

THE greatest advance in our knowledge of anatomy since the accession of HER MAJESTY to the throne is marked by the thoroughness and excellence of the various leading treatises on systematic anatomy. Between 1841 and 1844 the second edition of SÖMMERING'S Anatomy was published in eight volumes, revised and amended by BISCHOFF, HENLE, HUSCKHE, THEILE, VALENTIN, VOGEL, and WAGNER; and the sixth volume of this work, which was produced under the supervision of Professor HENLE, is the high-water mark of descriptive anatomy up to that date. CRUVEILHIER'S work on Descriptive Anatomy, which was translated into English by Dr. ALEXANDER TWEEDIE in the "Library of Medicine" in 1851, and which has since passed through several editions, is even now as worthy of study as most of our more modern text-books, and, with the Descriptive Anatomy of SAPPEY, published in 1847, prove that the French anatomists were in no way behind in this branch of science. TODD and BOWMAN commenced their Cyclopædia of Anatomy and Physiology in 1835, but twenty-four years elapsed before its completion, and it remains even up to the present date the best standard work on descriptive anatomy, although its physiological and histological details have been widely enlarged and improved on. In fact, ordinary descriptive anatomy has undergone no change, although some minor details have been revised, since the first really valuable work on Practical Anatomy came into the hands of, and was made use of by, every intelligent medical student. As text-books in Human Anatomy, those of HENLE in Germany, SAPPEY in France, and QUAIN and GRAY in England are models of what scientific text-books should be, and they are all products of the Victorian era.

Topographical anatomy was practically introduced by BLONDIN about 1830, but his work attracted but little attention until the works of HYRTL and LUSCHKA demonstrated to everyone that a new departure in anatomy had to be dealt with. Frozen sections came later and improved the *technique*, so that at the hands of PIROGOFF and LEGENDRE the relative position of the structures in the limbs in their normal position became absolutely known. HIS and BRAUNE extended this method to the abdominal and thoracic viscera, and on the basis of these researches the whole science of normal topographical anatomy has been built up. The elaborate work that has been devoted to this branch of anatomy in late years is, perhaps, best shown by the beautiful photographs of the anatomy of the brain by DALTON of New York, published in 1885.

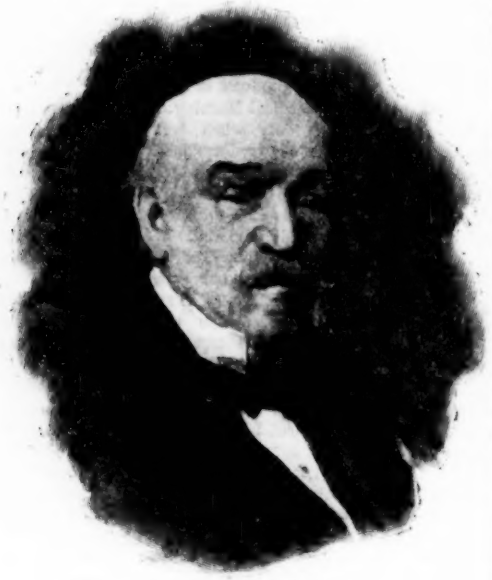
Morphological anatomy is almost a product of this century. A few isolated instances of abnormal variations in the body had been previously put on record, but no attempt to systematise them had been made. TIEDEMANN and RICHARD QUAIN the surgeon elaborately investigated the varieties of the main arteries in the human body, and this led them to some very important remarks on the ordinary procedures of operative surgery. WOOD and GRUBER'S researches, in addition to those of several other observers, have opened up the wide question as to the relation between muscular abnormalities in man and the normal arrangement of muscles in the higher vertebrates; but it is questionable if this line of inquiry has led to much lasting result, although at the time it seemed to be most promising.

MEDICINE: ITS SHARE IN THE GROWTH OF NINETEENTH CENTURY SCIENCE.

IT is not easy to realise the full extent of the changes that have been effected in the knowledge of the nature of diseases and of their more rational treatment during the sixty years covered by the reign of QUEEN VICTORIA. In almost every direction progress has been so marked that in contemplating it there is a risk of under-estimating the position which had been already attained by medicine in the opening years of the century. It is worth recalling that the first edition of WATSON'S "Lectures on the Principles and Practice of Physic" appeared in 1843 (based on the course delivered by its author at King's College in the session 1836-37), and that, marvellously as pathological science has developed since that time, those two volumes contain much that is of permanent practical value. There must be few medical men whose memories of the practice of medicine take them back to those days, which witnessed the awakening of science in all its departments. Nor should it be forgotten that modern medicine is greatly indebted for its development to the advances made in the ancillary sciences. Physics and chemistry, biology and morphology, have contributed to the fuller knowledge of animal structure and function, knowledge crowned by the researches of the physiologist. It is the application of these studies of the living body in health to that of the derangements that constitute disease which marks our era, an era that deserves to be known as that in which medicine, emerging from the thraldom of "systems" and theories, came to be placed on a rational basis and to gain a footing amongst the sciences. And as regards those who have taken a prominent part in assisting this uninterrupted progress this country has produced not a few whose contributions to clinical medicine and pathology have shed lustre on the reign, whilst during the same period we have reaped the benefits of the products of the genius of the great Continental centres of medical learning. Science knows no nationality, and it is only when we deal with great principles or root ideas that we are justified in placing one man or one nation above another; for the rest all the workers in the great edifice of knowledge may claim an equal recognition from the hands of a grateful humanity in whose service they have faithfully laboured. We ought not, therefore, in a review, however cursory, of the progress of pure medicine—the elder branch of our science—to allow any limitations, but should cheerfully recognise that all the world over there have been the same spirit and the same effort to seek out the secrets of disease, with the common object of its prevention and treatment.

Such a review may perhaps be most appropriately made under three divisions. The first would be an inquiry as to the methods and results of investigation into the intimate nature of diseases; the second as to the greater capacities for their detection and discrimination; and the third as to the enhanced power which has been gained by such knowledge in their control and management. These are the three departments into which medicine may be separated—pathology, clinical medicine, and therapeutics. Three lines of investigation have assisted in widening the conception of the nature of diseases, lines which came into operation successively and have since been pursued concurrently. They are the anatomical, the physiological, and the bacteriological. Of them, the first, dating from MORGAGNI, was the main field of pathological study at the dawn of the century, although the genius of JOHN HUNTER had foreshadowed the prominent

part which the observation of vital processes would come to take in the interpretation of morbid changes. At any rate, it would be safe to say that when the Victorian era opened the attention of pathologists was in the main confined to post-mortem dissection, and the study was rather of the effects than of the processes of disease. This study was, however, to gain a great impetus, and to have far greater significance than had hitherto been given it. The perfecting of the microscope, and the study by its means of the intimate structure of tissues and organs were about to open up an entirely new field of anatomical research. The importance of the "cell" as the ultimate element in all living things, its transformations and its powers were soon recognised, and received their fullest exposition in the memorable work of VIRCHOW on "Cellular Pathology," which appeared in the "fifties." The insight which the development of this branch of morbid anatomy, supplemented and aided by similar researches in normal anatomy and embryology, has given into the workings of disease has been enormous, so that the numerous published transactions of societies, and the text-books and monographs of this period literally teem with facts gleaned from microscopic investigation and the inferences drawn therefrom. Thus was obtained a clearer conception of the changes which accompany inflammation and repair, the degenerations, and, chief perhaps of all, the systematic and orderly analysis of new growths, not to mention the lesions which are produced in local diseases of individual organs. Nor was the older study neglected; it did not need the microscope to reveal to BRIGHT the fact that albuminuria and dropsy were associated with definite and varied lesions of the kidney, or to ADDISON that a special form of destructive inflammation of the suprarenal capsules was associated with a definite train of symptoms, including progressive pigmentation of the skin. The non-identity of typhus and typhoid fevers was established by STEWART



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and JENNER by an exhaustive study and comparison of gross morbid lesions with the clinical course and symptoms of continued fever; and the deep-seated changes wrought by syphilis were made known by WILKS before their minuter lesions were analysed. So has it been with many another disease which has been discriminated by careful observation; but once the distinction has been established the deeper scrutiny of the microscope has revealed still finer differences. Especially has this been the case with diseases of the nervous system, where, as we shall shortly see, clinical observation has been so fruitful of result within this epoch. Amongst the affections upon which inquiry has been especially fruitful in these years of active progress must be mentioned those diseases which depend on changes in the blood and blood-forming organs, rickets and diabetes, cretinism and myxœdema, osteitis deformans and acromegaly, to name only a few where the morbid characters are obvious and striking, but where, too, the knowledge gained from anatomical observation has been vastly supplemented by that of clinical study.

Much as has been learned by the purely anatomical method, its limitations were soon obvious to those who felt that the solution of the mystery of the living body was not to be found in the dead tissues. The application of the principles of the physiologist to the elucidation of disease processes was, however, neither so simple nor so satisfactory a line of research as the older method. Yet the expansion of knowledge upon the nature of disease which has ensued from this field of inquiry has been wide and is far from being completed. To the school of experimental pathology—in which the names of TRAUBE, the physician, and of CONNHEIM, the pathologist, stand prominently out—is owing a large part of our knowledge of the actual process of inflammation, of the derangements of the circulation, and of disordered nerve function, in which latter CHARLES BELL and MARSHALL HALL were pioneers. Here, too, must be acknowledged the light shed on the intimate processes of nutrition and nutritional disorders which are still engaging the attention of the physiological chemist, for they involve problems that are amongst the most difficult of solution. The researches of CLAUDE BERNARD and of PAVY have given us an insight into the pathology of diabetes; those of BOUCHARD and his pupils into that of uræmia and the blood states due to "self-intoxication" from defects in elimination or the absorption of poisons generated in the alimentary canal. The study of the gastric secretion is tending to a rational differentiation of the great group of the dyspepsias, whilst the chemistry of gout and rheumatism is advancing us to a more accurate perception of the *rationale* of those blood states. The recognition of the causes and effects of increased arterial tension and the philosophical views of GULL and SUTTON have done much to give breadth to our conceptions of chronic Bright's disease. The subjects of animal heat and the phenomena of fever have attracted investigators both in physiology and in pathology, with the result that many facts and theories have been harmonised, even if some of the latter have been found inadequate to explain all the former. Indeed, it would be difficult to point to any subject in which the physiological method of research has not been applied with more or less success to elucidate the phenomena of disease.

Meanwhile, however, the problem of disease has been attacked from another side—one, too, which considering its comparative newness has been almost more prolific of result than any other. When PASTEUR by his studies on fermentation and putrefaction discovered the part played therein by the operation of living organisms, it must have been far from the thoughts of the pathologist that these researches could have any bearing upon the causation of diseases. But by his investigations he, a chemist, was laying the foundations of an edifice that was to replace the less substantial fabrics of all the pathologists, and he lived to see it attain dimensions that bid fair to embrace the whole range of infective diseases. There is no subject in the whole history of medicine which has more rapidly attained to an unassailable position in so short a space

of time than this of the explanation of infective diseases and inflammation by the intervention of bacterial parasites. The science of bacteriology has grown up under the eyes of the present generation and has revolutionised our conceptions of the nature of disease. The speculations of HALLIER and HENLE upon the germs of disease, the theories as to contagion and infection which engrossed attention during the first half of the period of which we are speaking, have in the latter half—nay, indeed, in an even briefer space—been dispelled by the proven facts of bacteriological investigation, since the day that KOCH conclusively demonstrated the pathogenic properties of the anthrax bacillus or OBERMEIER proved the dependence of relapsing fever on the spirillum that bears his name. There is no need here to recount the steady progress to which this pursuit of minute cryptogamic studies has led us in relation to disease; but without a doubt it may be affirmed that in this pursuit, and in all that flows from it, we have the most striking instance of the gains acquired by medicine in this century, and have entered on a field of research which is by no means exhausted.

Meanwhile, if the nature of disease and its causation have become plainer and been placed on a more scientific basis, it must be admitted that *pari passu* there have been most notable additions to the methods of clinical investigation, which have vastly extended the powers of accurate diagnosis. This has been mainly effected by the invention of scientific instruments and appliances, nearly all of which were subsequent to the time at which our survey opens. For sixty years ago but a short time had elapsed since LAENNEC'S genius had demonstrated the new field of observation opened by the use of the stethoscope—an instrument which was then only appreciated by the few, perhaps even despised by the many. In this country we cannot forget how much is owing to C. J. B. WILLIAMS, HUGHES BENNETT, and WALSHE for their studies on the methodical examination of the chest by physical exploration. The interpretation of signs would have been of small service had it not been combined with the more accurate knowledge of the morbid changes in heart and lungs which gave rise to these phenomena. Thus as knowledge grew in the one direction it was helpful to progress in the other, and much as those who claim to be "practical" rather than "scientific" men may affect to ignore the teachings of pathology, it is clear that no one can be eminent in clinical medicine who has not laid a good foundation in pathology. As the years rolled by we find additions made to the clinical armamentaria, such as the thermometer (first used clinically in 1850), the ophthalmoscope (1851), the laryngoscope (1857), whilst the aid given by electro-physiology in diagnosis forms another of the remarkable developments undergone in the study of diseases of the nervous system. Indeed, there is no department which has developed to so great an extent during these two generations as this of neurology. And much of this advance has been owing to thorough and minute clinical observation, which has often led the way for physiology to follow in interpreting the functions of nerve and muscle. The localisation of cerebral functions, the discrimination of the "system diseases" of the spinal cord, the differentiation of spasmodic muscular affections and of the forms of muscular atrophy, the study of neuritis,—these, and many more are the fruits of the clinical medicine of our day, supplemented by pathological and physiological research. We are proud to think that in this study so much has been done by the fellow countrymen of BELL, MARSHALL HALL, and ABERCROMBIE, for where would neurological science have been had not HUGHLINGS JACKSON, REYNOLDS, GOWERS, FERRIER, CHARLTON BASTIAN, BUZZARD, and many others made their invaluable studies on the subject? There is no need to dwell on the other means which have been freely used for the study of disease—the clinical use of the microscope and of the test-tube, the invention of the sphygmograph and cardiograph, and other instruments imported to bedside observation from the physiological laboratory. Enough has been said to show that no means have been left untried to procure greater accuracy in diagnosis and to bring to bear on the investigation of disease every available resource which thought and ingenuity can suggest. Thus has it happened that our present knowledge of the nature and processes of diseases is of far deeper extent and wider range than it was when the QUEEN was called to the throne.

It remains to inquire whether there has been a similar advance in the art of healing. In answer to this it cannot be forgotten that perhaps the chief gain to medicine has not been so much in the direction of the actual treatment of disease as in that of its prevention, a line of practice that has naturally followed upon the tracking out of the causes of disease. The Victorian era has been characterised by the rise and development of sanitary science, and nations have learnt that their principal care lies in the exercise of forethought and the wide application of hygienic principles. Cleanliness and purity of air and water and of food and drink, the more wholesome construction of dwellings, the avoidance of overcrowding, the practice of measures of isolation, the control of unhealthy occupations, the better management of factories, and many another effort to attain conditions which tend to diminish disease, have received increasing attention. And it is in this country that the principles of public health were earliest recognised and put to practical use. Surely this is in itself an achievement which marks an epoch in the history of medicine, with which the names of CHADWICK, of SIMON, and of PARKES will be always associated. And with these efforts to prevent disease on the large scale ought we not also to point to the praiseworthy exertions of those who have striven by precept and example to inculcate a knowledge of the laws of health among the people, and thereby to diminish the suffering and death which ensue on the neglect of these laws? Hygiene, public and personal, is the keynote of modern endeavour to limit the ravages of disease, and it is owing primarily to the medical profession that the gospel of prevention has been so widely spread. If we turn from this—the main gain of enlightened medicine—to the progress made in the actual treatment of diseases, we cannot fail to be struck by the change that has been effected within our day. Such a revolution of ideas as that which caused the abolition of wholesale venesection and of the lowering treatment of fever is not to be explained by caprice or fashion. There has, on the contrary, been a growing effort to place medical therapeutics upon a rational basis, to determine with accuracy the action of drugs, and to limit their prescription to definite objects. Thus we witness the gradual emergence from the empirical to the scientific, the recognition of the limits of physic, and the introduction of methods other than those in which drugs are concerned. Doubtless this altered standpoint is largely due to profounder knowledge of the lesions that it is sought to remedy, but it is equally to be found in the domain of so-called functional as well as of organic disease. Moreover we have seen within quite recent days the direct application of more exact knowledge of the nature of disease to measures for its mitigation or remedy, as in the remarkable result of the thyroid treatment of myxœdema, the Pasteurian treatment of hydrophobia, and the antitoxin treatment of diphtheria. In these and analogous departures there is evidence that the study of therapeutics is becoming more scientific and less empirical, more rational and less a matter of chance or guesswork than it has ever been before. Yet a few years and the nineteenth century will have reached its term.

Those who essay to record its achievements will find no chapter more interesting than that which deals with medicine. To detail the progress made in each of its departments would amount to the compilation of a cyclopædia, but whoever undertakes the task will find that the most progress and the greatest gains have been made and won in that portion of the century that corresponds to the glorious reign of our illustrious Sovereign; for just as the Elizabethan era was characterised by triumphs in letters and learning, the Victorian era will be known as that wherein science established its dominion and lent its powerful aid to the cause of humanity.

SURGERY: ITS REMARKABLE PROGRESS DURING THE REIGN.

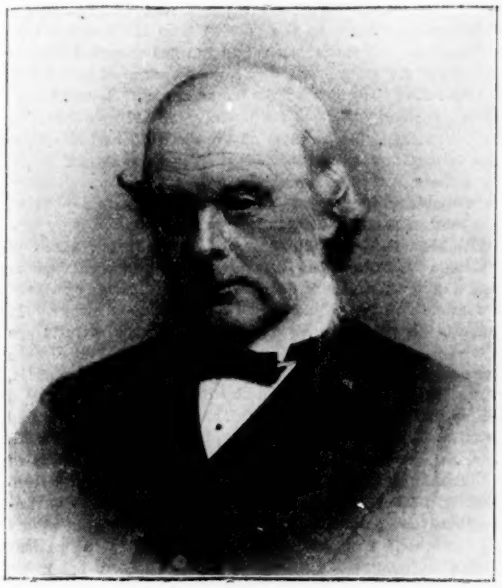
GREAT as has been the progress in so many of the arts and sciences during the present reign, yet surely in few has so much advance been made as in surgery. Not that we would for a moment suggest that surgery had not progressed before 1837, for then there were many surgeons living who had done much for the advancement of their art. Taking London alone we find the names of many who will long be remembered as worthy exponents of surgery, and all of whom have done something to put it on a more scientific basis. To mention only a few, there were ASTLEY COOPER, JOHN SCOTT, CURLING, WILLIAM LAWRENCE, EARLE, STANLEY, SKEY, JAMES WARDROP, SAMUEL COOPER, LISTON, RICHARD QUAIN, the author of the Anatomy of the Arteries, GUTHRIE, BENJAMIN BRODIE, and HAWKINS. As each name strikes the eye it calls up some important surgical fact, some interesting surgical method, superseded, perhaps, now, but still of value as indicative of the unceasing progress which takes place in surgery. Yet though there were indeed giants of surgery in those days, were a surgeon of to-day to return to a ward or an operating theatre of 1837 he would feel overwhelmed by the immense differences between the practice of those days and of our own.

If we were asked to indicate what had done most to bring about the change from those far-off times to these latter days, we should have no hesitation in saying that two things had contributed more than all others to the difference, and these two things are anæsthetics and antiseptic surgery. In operations before the introduction of anæsthetics manipulative dexterity was one of the greatest virtues which a surgeon could possess, for rapidity of operation was essential when the patient was fully conscious of every stroke of the knife; and so surgeons such as FERGUSSON and LISTON arose, whose manual skill was a marvel to their contemporaries. Amputation of the thigh was performed in less than two minutes, and five minutes amply sufficed for extraction of a stone from the bladder by the lateral method. Such celerity in the performance of major operations is now practically a thing of the past, it is no longer needed, and careful dissection has replaced the lightning movements then in vogue; but it is by no means certain that surgical practice has not gone too far in the opposite direction, and we cannot but think that in many cases the "shock" of an operation would be materially lessened by a more rapid system of operating.

Though attempts had been made from the earliest times to prevent or diminish in some degree at least the pain in surgical operations, yet the results must have been unsatisfactory, as the methods fell quickly into disuse and were replaced by others equally unavailing. In 1844 an American dentist, HORACE WELLS, of Hartford, Connecticut, inhaled nitrous oxide gas in order that he might have a tooth extracted, and finding the attempt successful in his own case he employed the method with varying success in other similar cases. Two years later W. J. G. MORTON, of Boston, employed the vapour of ether, "sulphuric ether" as it was called, for relieving pain in tooth extraction, and a little later he administered it in the Massachusetts General Hospital to a patient who was about to have a tumour removed from the neck. The practice quickly spread, and in December of the same year (1846), at the University College Hospital, London, LISTON amputated the thigh of a patient under the influence of ether, but as he had little faith in its efficacy he operated with his usual rapidity. A year later chloroform was introduced by SIMPSON of Edinburgh, and for a long time replaced ether as an anæsthetic in this country; but the frequency of the occurrence of death during chloroform narcosis has lead in England to a return to ether as the ordinary anæsthetic. In Scotland, however, chloroform is still the agent most employed. Nor should the benefits of local anæsthesia be overlooked. The first form used was the result of cold produced by ether spray; it was introduced by B. W. RICHARDSON in 1865. The ethyl chloride spray, a much more recent introduction, is also much used; but of all local anæsthetics by far the most valuable is cocaine, which was not employed till 1884, when it was introduced by KÖLLER, of Vienna, though it was discovered in 1859. It is readily absorbed by all mucous membranes, but unfortunately it cannot pass through the epithelial layer of the skin, so that its use is somewhat restricted; but in many operations upon the eye cocaine has completely replaced general anæsthetics.

The other great agent in the extension and advancement of surgery has been the systematic practice of asepsis. Sixty years ago the treatment of operation wounds varied a great deal. In LISTON'S practice the flaps were allowed to remain apart for three or four hours so that the surfaces became glazed with adherent exudation before they were drawn together, and healing by first intention by no means rarely followed, but suppuration was unfortunately the rule, and many weeks had to pass by before healing was complete. Another method with very similar results was the "open treatment" of BARTSCHER and VEZIN (1856). In this the wound was covered only with a piece of linen, and in a few weeks healing was complete. In this way VOLKMANN, of Halle, treated all his amputation wounds during the war of 1866. Perhaps the most usual treatment was by irrigation or immersion, and some surgeons—as VALETTE, of Lyons, in 1855—added various antiseptic substances, such as alcohol, benzine, and creosote, to the water. Though, as in this case, substances possessing antiseptic properties had been employed for many years in the treatment of wounds, yet the antiseptic method of LISTER was really an entirely new departure. The researches of PASTEUR and TYNDALL had proved the almost universal presence of organisms giving rise to putrefaction, and also that if these germs were excluded decomposition could not occur. LISTER applied these facts to the treatment of wounds, and conclusively proved that in the absence of septic organisms there was no formation of pus, and wounds healed always by first intention. The publication of such satisfactory results in 1870 was rapidly followed by the general adoption of the "Listerian" method. At first there was a certain amount of opposition, and some surgeons declined to turn aside from the paths they had trodden so long; but these were exceptions, and practically the whole surgical world adopted the new process with acclamation. The effect on the prevalence of all forms of septic diseases—such as erysipelas, septicæmia, and pyæmia—was most striking. The testimony of NUSSBAUM, of Munich, is that "during sixteen years the hospital was never free from pyæmia for a single month, and yet it suddenly disappeared on the introduction of the Listerian method." At first the antiseptic treatment consisted of a most elaborate ceremonial, and with slight modifications it continued very much the same for some years, but ideas slowly began to change with regard to the prevalence of septic micro-organisms in the air. It was found that the danger of germs falling into the

wound during an operation was much less than had been imagined, and so the "spray" was given up. More recently still it has been recognised that unless germs have already made an entrance there is no need to employ any "antiseptic" in the wound; it is sufficient if everything that comes in contact with the tissues is aseptic.



LORD LISTER.

Thus the "aseptic" treatment of wounds has arisen and in great part has replaced the antiseptic treatment, though it is really only a further extension of the same idea. When "asepsis" is carried out thoroughly and conscientiously every wound heals absolutely by first intention, and suppuration in even the slightest degree is banished.

The progress which has taken place in British surgery during the last sixty years cannot be dissociated from the progress of surgery in other countries. There is no surgery exclusively British, for surgery is cosmopolitan, though there are slight differences between surgery as it is practised in Britain and as it is practised in France; but we can also find slight differences in surgical practice between London and—say—Liverpool, and these differences are not in any way inconsistent with the truth that surgery is one and indivisible. In considering, therefore, the progress of surgery our view must include the whole civilised world. Amputations formed the branch of surgery in which perhaps the greatest success had been attained in days anterior to the present era. The circular method and the flap method with various modifications were well known, but the "modified circular" amputation, which LISTON introduced in 1839, was a distinct advance, and it is still extensively practised. In 1853 TEALE, of Leeds, devised his rectangular flap method; yet, although it possesses many meritorious features, it is only occasionally used, as it sacrifices a great extent of the limb. The special amputations which have been introduced are more numerous. Among them may be mentioned SYME'S amputation at the ankle-joint, in which he reduced to a regular operation what had been done by many for a long time previously. PIROGOFF'S modification of SYME'S operation is also worthy of notice. Amputation through or above the condyles of the femur was first practised as early as 1845 by JAMES SYME, but it was brought more prominently into notice by CARDEN, of Worcester, in 1864; GRITTI, of Milan, in 1857 introduced the retention of the patella after removal of its articular surface, and W. STOKES in 1870 still further improved the operation. The results of amputation at the hip-joint are now much better than they used to be, and this in great part is due to the diminution of the shock by the employment of the method devised by FURNEAUX JORDAN. In gunshot wounds far better results are now attainable. It has not very long been recognised that in many cases a gunshot wound is aseptic, and that many will heal almost by first intention if they are not injudiciously probed, and many joints traversed by a bullet are now saved by antiseptic treatment in which formerly amputation would have been performed. The increased velocity of modern projectiles has led to greater splintering of the bone, but our improved methods of dressing such wounds have more than compensated for the increased damage done. The great diminution in the diameter of the bullet has been made too recently to enable decided opinions to be expressed as to the effect on the surgery of gunshot wounds.

In the treatment of hæmorrhage during the period we are considering many decided advances have been made. Artery forceps and the ligature were in ordinary use in 1837; torsion was also sometimes employed, and though it has been, and still is, much used for small vessels, yet it has never to any real extent displaced the ligature for the occlusion of large vessels. Forcipressure, or the seizure of the end of the vessel in a powerful pair of compressing forceps, was introduced by SPENCER WELLS, and has also been employed by KOEBERLÉ and PÉAN. It is now but little employed, though the forceps devised for the purpose are those chiefly used now for the ligature or torsion of arteries. Absorbable ligatures, though used to a very slight extent by ASTLEY COOPER, have only been frequently employed since they were re-introduced by LISTER as a part of his antiseptic treatment.

A great advance in the temporary arrest of bleeding was made by the introduction of the elastic-tube tourniquet by ESMARCH, of Kiel, in 1870.

The treatment of aneurysm by compression of the supplying artery was introduced by the Dublin surgeons, especially HUTTON, BELLINGHAM, TUFNELL, and CARTE; and the tourniquet devised by the last of these, providing, as it does, an elastic pressure, is still the form most commonly employed for instrumental compression. Digital compression was first employed by VANZETTI, of Kharkof, in 1846, and later by KNIGHT, of Newhaven, U.S.A., in 1848. It is now very widely and successfully used.

The very excellent results we now obtain after suturing of nerves, whether primary or secondary, make it difficult to believe that it is a comparatively recent introduction, having been first performed by WEIR MITCHELL; he was followed by NÉLATON, LANGIER, LANGENBECH, HOLMES, MACCORMAC, and many others, and it is now an ordinary procedure. Nerve-grafting, also, though not so uniformly successful as suture of nerves, in some cases gives very satisfactory results.

For the treatment of fractures numerous splints have been devised, but of them all the most useful is undoubtedly that formed by plaster of Paris. In its original form the plaster was rubbed into the meshes of a coarse muslin bandage, but of late years the Bavarian splint, or the modified Bavarian splint, with which CROFT'S name is usually associated, has been more commonly employed. The original form, however, is still used, especially for SAYRE'S plaster jacket.

Compound fractures are no longer dreaded by surgeons as they once were, for antiseptic treatment has almost entirely robbed them of the dangers they possessed.

In fracture of the patella wiring has become almost the

rule with many surgeons, and the results on the whole justify this mode of treatment. Though it had been tried many years ago it failed on account of sepsis, and therefore it was not until it was employed with antiseptic precautions by HECTOR CAMERON, of Glasgow, in 1877 that it became a satisfactory method of treatment.

In dislocations the use of anæsthetics has rendered the replacement of the displaced bone an easy and simple procedure in most cases, and especially has reduction been aided by the scientific methods of inducing the head of the bone to retrace its steps and pass through the torn capsule at the spot where it came out. Though manipulation was employed many years ago it was not until H. J. BIGELOW, of Harvard, demonstrated its *rationale* in dislocation of the hip that the method was at all extensively used.

Malignant growths are now removed with much greater freedom than formerly, and to this must be attributed the greatly improved results which are obtained, recurrence being decidedly rarer than it was. Though the excisional surgery of the joints was not absolutely unknown in the eighteenth century, and though LISTON had excised the elbow-joint as early as 1821, yet it was not until FERGUSSON performed excision of the hip-joint in 1850 that the operation received general support. For many years excision was applied to most of the joints of the limbs, but of late years it is by no means so extensively practised. It has been in part replaced by erasion or arthrectomy, and in other cases by drainage of the joint the surgeon succeeds in obtaining a cure. Erasion was first performed in England by WRIGHT, of Manchester, in 1831; it is on the whole more applicable to the knee, where strength is required, than to the elbow, where the attainment of mobility should be the first consideration.

The surgical treatment of the bony deformities of the lower limbs resulting from rickets or ankylosis is practically entirely modern. Genu valgum was treated by DELORE, of Lyons, by forcibly straightening the limb; the results were somewhat uncertain, and it has been replaced in great part by osteotomy. In 1875 ANNANDALE sawed off the inner condyle of the femur, and a year later OGSTON did the same operation subcutaneously. In 1878 MACEWEN, after practising section of the inner condyle, chiselled through the bone above the epiphyseal line, and this is the method now employed. W. ADAMS first performed his operation for ankylosis of the hip-joint of subcutaneous division of the neck of the femur in 1869, and F. J. GANT'S method soon followed, the femur being divided below the trochanters. The removal of an enlarged thyroid gland had been practised so far back as 1820, but the result was so unsatisfactory from hæmorrhage and septic infection that it fell into disuse. Since 1870, however, the operation has become fairly common, especially in Switzerland, where the prevalence of bronchocele is so great, KOCHER, of Berne, having had several hundred cases with an insignificant mortality. It was not long, however, after total extirpation of a goitre had become a frequent operation before it was noticed that most of the patients underwent a curious derangement of the general health. The resemblance of the symptoms to myxœdema described by GULL in 1873 was soon observed, and it was seen that these symptoms were due to the absence of the thyroid gland; since then surgeons have not ventured to remove more than a part of the organ. In many cases, especially recently, it has not been found necessary to do more than enucleate an adenoma from amongst the gland substance.

It is in the surgery of the abdomen that the greatest advance has been made. At the beginning of the era there was no surgery of the abdomen; wounds involving the peritoneum were looked upon as almost necessarily fatal; and even though in the early years of the century, both in England and in America, the operation of ovariotomy was occasionally performed, yet it was not until 1857 that it was fully recognised as justifiable, and this was undoubtedly due to SPENCER WELLS. The antiseptic treatment has also materially assisted the extension of ovariotomy. The knowledge gained in this operation, especially after the introduction of antiseptics, led naturally to attempts to treat surgically injuries and diseases of the abdominal viscera. At the present time the surgeon does not hesitate to deal with stabs and gunshot wounds involving the bowel, for suture will give a good chance of recovery if the operation has not been too long delayed. Laceration of the kidney and spleen is successfully treated by excision of the torn viscus. In rupture of the stomach and intestines also laparotomy gives good results, and the results would be better still if it were possible to operate earlier. Rupture of the bladder, at one time almost certainly fatal, is now frequently successfully treated by laparotomy and suture, the two earliest successful cases being those of WILLIAM MACCORMAC. Flushing the peritoneal cavity with a mild antiseptic or sterilised water is in many cases of abdominal operation an important aid to success. In disease, also, of the abdominal viscera the results are almost as satisfactory. Pylorectomy for malignant disease was suggested by BILLROTH in 1877, but the first two cases, performed by PÉAN in 1879 and by RYDYGIER in 1880, ended fatally, and the first successful case was that performed by BILLROTH in 1881. The operation will always be rare, as but few cases are suitable for it. In cases of malignant disease of the pylorus in which the neighbouring parts are so implicated that excision is impossible the palliative treatment by gastro-jejunostomy is available, and in some cases enables a patient to survive in comfort for several months. There are many other operations on the abdomen which we can only mention, such as the operations for abscess and for hydatid of the liver (the latter first performed by LINDEMANN of Hanover); cholecystotomy, for a distended gall-bladder; removal of a gall-stone from the cystic duct, suggested by THUDICHUM in 1859, performed by MARION SIMS and by LAWSON TAIT in 1878; choledochotomy, first performed by KUMMELL in 1890 and later by KNOWSLEY THORNTON, VOIGT, KORTE, ABBÉ, and others; and cholecystenterostomy, suggested by WILLETT in 1886, and first performed in England by MAYO ROBSON. The surgical treatment of acute intestinal obstruction gives very satisfactory results, laparotomy being performed and the cause of the obstruction removed. For chronic obstruction lumbar colotomy was revived in 1839 by AMUSSAT, but during the last few years the far older operation of LITTRÉ—namely, inguinal colotomy—has been reintroduced, and is now the operation usually performed.

For the radical cure of inguinal hernia a large number of operations have been employed. Previously to the introduction of the antiseptic method the operators attempted to perform a cure without making any incision; the chief methods employed were those of C. W. WUTZER, of Bonn, introduced in 1838, and of JOHN WOOD; the latter was by far more commonly employed; but the open method is the only one used at present. The operations now in use are very numerous, and have been introduced by LISTER, ANNANDALE, MITCHELL BANKS, CZERNY, BALL (1887), MACEWEN, HALSTEAD (1890), and BASSINI (1890).

CHESELDEN'S lateral operation of lithotomy continued up to recent years to be the chief method of removing a stone from the bladder, but it is now only rarely performed. So far as cutting methods are concerned the revived suprapubic operation is chiefly used, but the same operation is still more frequently performed for exploring the bladder and for removal of growths of the bladder and prostate. Lateral lithotomy has chiefly been replaced by lithotrity.

The method practised by CIVIALE in 1824, and improved by FERGUSSON, SKEY, and HENRY THOMPSON, came to be the method of treatment for selected cases of vesical calculi; but it was not until 1878, when BIGELOW introduced litholapaxy or lithotrity at one sitting, that lithotrity became the chief method of dealing with stones of all sizes. In 1836 KEEGAN showed that children were suitable cases for lithotrity. The introduction by LEITER of the cystoscope has greatly facilitated the diagnosis and treatment of diseases of the bladder.

In the surgery of the brain very great progress has been made. No longer are fractures of the vertex of the skull considered to be of especially bad prognosis, for with care and antiseptic treatment they usually heal readily; but it is especially in injuries and diseases of the brain, where the localisation of the lesion would formerly have been impossible, that we can appreciate most the advance which has been made. There is still a large portion of the cortex the function of which is unknown to us, but disease of most parts of the brain declares clearly its locality by the symptoms and signs to which it gives rise. As a result of this knowledge surgeons have been much more ready of late years to explore the cavity of the skull. In 1883 MACEWEN, of Glasgow, trephined successfully for hæmorrhage; and later in the same year he removed a soft mass from the Rolandic area. GODLEE, in 1884, removed a glioma from the position in which its presence had been diagnosed. Others who have done much work in this field are VICTOR HORSLEY and LUCAS CHAMPIONNIÈRE.

Though a form of the laryngoscope was invented in 1829, yet it was not until 1857 that a useful laryngoscope was devised by CZERMAK. Of the various operations which have been performed on the larynx space does not allow us to speak, but we may mention that excision of the larynx was first performed in 1866 by P. HERON WATSON. He was followed in 1873 by BILLROTH. Amongst the recent additions to aids to diagnosis none can compare in importance with the ROENTGEN rays, which were first described in January, 1896; there can be but little doubt that their usefulness will increase, and even at present they are of extreme value.

MIDWIFERY: THE PART PLAYED BY ANÆSTHETICS AND ANTISEPTICS.

THE changes that have taken place in obstetric medicine during the past sixty years, both in the region of theory and as regards the details of practice, are, as everyone knows, in most directions considerable, and in some directions even wonderful. To chronicle these changes with any degree of completeness would necessarily require several volumes, since they could be only fully dealt with by making an abstract of all the works on midwifery and gynæcology, text-books, monographs, pamphlets, and current literature that have been written on these subjects during the period under review. Here we shall only attempt to sketch in the merest outline some of the more important alterations that have occurred. We say advisedly "alterations," since, with all the desire in the world to view matters from a judicial standpoint, we cannot altogether hope to free ourselves entirely from the bias of our own day. Some of the alterations that have occurred in both midwifery and gynæcology since the year 1837 have been regarded at one time as changes in the direction of true progress and at another time, and even by the same generation, as deviations from the real highway into by-paths that, after promising well for a time, led backwards into the darkness which it was hoped had been left behind. In some things, after all allowance has been made for the tendency of each generation to regard itself as superior in knowledge and skill to those that have preceded it, there can be no doubt that real progress has been made, while it is not impossible that in some others the appearance of progress has been fallacious; and it may be that the wider knowledge and larger experience of those that are to come after us will lead them to the conclusion that the authorities of sixty years ago were in some ways not so far wrong after all. We have only to turn for a moment to the region of art to find convincing proof that the lapse of time is not necessarily equivalent to progress, and that indeed the knowledge and skill of to-day may in certain directions be immeasurably inferior to that of, say, a hundred years ago. Such arts as the production of certain kinds of china and of silverwork are good examples of what we mean. As to china, some of the methods and knowledge familiar to many not so very long ago have been totally lost, and the silver-work of the modern workman, with all his advantages and School Board education, is poor indeed compared to what his great-grandfather, who without, very likely, being able to write was in many ways an artist instead of a mere workman, was able to produce. The process by which the practitioner of sixty years ago was evolved was essentially different from that which produces the practitioner of to-day. The latter is no doubt in many respects the better man; but probably something that pertained to his predecessor has had to be sacrificed in order to secure this superiority.

After these preliminary reflections we may come to matters of detail. The changes in the department of midwifery have not been so tremendous and striking as those in gynæcology, no doubt because midwifery is of necessity such a very ancient art. In midwifery, at all events, we do not think we can find any indication of ground having been lost. If we regard the matter from the standpoint of a woman who is pregnant at the present time as compared with that of a woman similarly situated in 1837 the former is undoubtedly in a more favourable position. We should say that should the pregnancy happen to be extra-uterine the advantage of living in 1897 rather than in 1837 is so great that probably no one would care to dispute it. In a standard text-book published in 1841 extra-uterine pregnancy is spoken of as follows:—"This singular deviation from the usual course of conception is fortunately of rare occurrence, for few cases terminate favourably. If it be in the Fallopian tube ..... the patient usually dies from internal hæmorrhage." Modern investigation has, however, shown that cases of extra-uterine pregnancy are by no means so uncommon as was formerly supposed, and that even when a tubal pregnancy has ruptured, causing intra-peritoneal hæmorrhage, the case is very amenable to operative treatment, if seen in time. Many cases have now been recorded where a definite diagnosis of tubal pregnancy has been made before rupture, and where the gravid tube has been successfully removed. There is, of course, in the works on midwifery contemporary with that just referred to nothing to be found on the subject of antiseptics or anæsthetics. We should regard the application of the antiseptic principle to midwifery as the greatest improvement that has been made in obstetric practice within the last sixty years. When it is fully understood and faithfully employed deaths from puerperal fever may be completely or almost completely avoided, as the practice of our best-managed lying-in hospitals has sufficiently shown. Even at the present day, however, in general practice it would appear from the statistics recently published by CULLINGWORTH that puerperal fever is still responsible for a relatively high percentage of fatalities which, it is to be hoped, may be prevented as the details of the antiseptic principle come to be more universally adopted. As regards puerperal fever the same authority already quoted writing in 1841 says:—"But we now come to a source of danger which follows the most favourable as well as unfavourable labours—which is extremely varied in its nature, fatal in

its effects, and (what renders it so peculiarly formidable) by no means uncommon in its occurrence. Of all the dangers to which a lying-in woman is exposed puerperal fever is by far the most to be dreaded; there are few or no difficulties during parturition which the practitioner has to contend with that can be compared to it; there are none in which he is frequently made to feel so helpless and his various means of treatment so utterly inefficacious; certain it is that puerperal fever in its worst forms has occasionally committed such ravages among patients of this class as to rival in destructiveness the most malignant pestilences with which the human race has been afflicted." With this obviously true picture of the state of things in 1841 before us, it is surely the most noteworthy achievement in obstetric practice of the last sixty years that the nature of this pestilence has been arrived at, sufficiently at least to enable us to prevent its occurrence provided the necessary precautions, which are now well known, be observed.

As regards phlegmasia dolens, or rather as it is there given "phlegmatia dolens," we quote from the same authority (1841): "Phlegmatia dolens rarely or never proves fatal of itself; the patient either dies in consequence of the puerperal fever which has preceded or attended the affection, or from the system gradually sinking under the injury which it has sustained." Nothing was apparently known at that time of the connexion between phlegmasia dolens and pulmonary embolism.

To sum up the matter, broadly speaking the midwifery of sixty years ago did not differ so very materially from the midwifery of to-day, except—and the exceptions are of the greatest importance—that it was conducted without the assistance of anæthesia and without the employment of antiseptics.

SIR JAMES SIMPSON.[1]

It is when we come to consider the progress of gynæcology during the period under review that we are confronted with changes of the most striking kind. Its progress has been marked, however, by many false starts. Theories as to the causation of many of the diseases peculiar to women have been advanced, have become rapidly fashionable, have dominated practice for a time, and have then been proved unsound and have disappeared into a well-merited oblivion. There is, for instance, the period when gynæcological practice was largely influenced by the belief that the so-called "ulceration" of the cervix was accountable for most of the symptoms complained of in relation to the pelvic organs. JOHN WILLIAMS has drawn a vivid picture of the state of things that prevailed about this time. He says: "During my early student days women suffered mainly from two diseases—ulceration of the cervix, which was rubbed weekly with nitrate of silver, and stricture of the cervix, which was dilated with bougies at similar intervals." Then there came the time when the malposition, so-called, of the uterus was supposed to be the key to a right understanding of the majority of women's ailments. The uterus was considered to be pathologically flexed or "verted" in this or that direction, and instruments innumerable were invented and used to correct the displacement. The worst offenders in this class were those who held strong views as to the importance of flexions, and carried their opinions to the logical conclusion in practice by introducing a rigid stem into the cavity of the uterus. They were more mischievous than the pessaries, merely invented for insertion into the vagina. The latter, for the most part, merely acted as foreign bodies that did little harm, if they did no good. But the intra-uterine stems were a source of actual danger to those unhappy enough to be condemned to wear them. Modern investigation has shown that the so-called "ulceration" of the cervix (by which is understood the various forms of erosion) occupies a position of little or no pathological importance, and that the uterus may be allowed to have a very considerable choice as to the situation it may occupy without this freedom of choice in any way acting to the prejudice of its possessor.

It is undoubtedly in the direction of the surgical treatment of the graver diseases peculiar to women that the greatest triumphs have been won during the last sixty years. The rise and progress of ovariotomy till it has come to its present position afford the most remarkable instance in this category. The treatment of cases of ovarian tumour is described in a standard work published in the year 1844 as follows: "Here then are the different modes of treatment recommended in ovarian dropsy: the abstraction of the water with the cautions before described; the extirpation of the ovary in the earlier and later periods of its growth; the removal of a circular piece of the cyst so as to lay open the cyst into the peritoneum; and the prevention of the dilatation and growth by early paracentesis. In the present ill-success of our practice all these operations are well worth your consideration; and if you can bring one of them to such perfection as to cure some of the unhappy individuals who now fall victims of the disease, you will indeed be conferring an invaluable good on the fairest and least offending part of our species." Which of these operations has been brought to the perfection just mentioned is now a matter of common knowledge; and all honour to those whose work established it in its present position. In the treatment of cancer of the uterus practice has also undergone a revolution during the past sixty years. In a standard authority published at the beginning of this period we find both excision of the cervix (the vaginal portion only) and removal of the whole uterus mentioned as possible forms of treatment. The mortality of both operations at that time was frightful. Nineteen cases of extirpation of the uterus are mentioned, of which sixteen died; and it is further stated on the authority of VELPEAU that the operation had been performed twenty-one times in twenty years, and that in not one of the cases was there any permanent benefit. The changes that have occurred since then in the results of such operations are sufficiently familiar to our readers. While the success of

[1] Vignetted by permission from a woodcut in the "Practitioner."

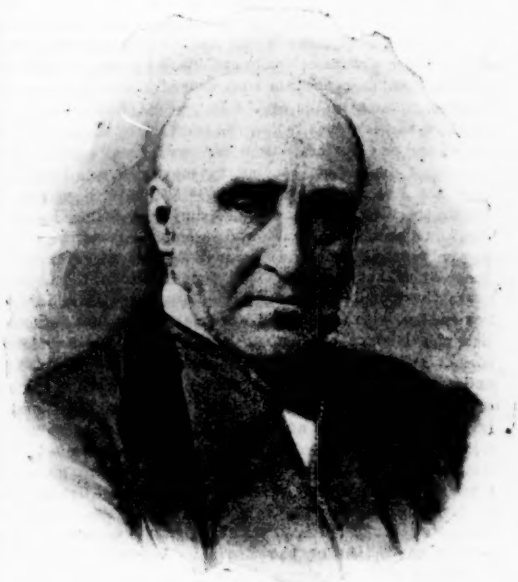
surgical treatment in the cases just referred to has been a matter for the warmest congratulation, it must not be forgotten that there have been drawbacks attending it. The success of ovariotomy has undoubtedly led to the removal of ovaries and uterine appendages in cases where such an operation could not be justified in the opinion of men of moderate views. The measure of safety introduced into all operations by the observance of asepsis has undoubtedly had a tendency to cause a multiplication of operations both major and minor in gynæcology, some of which are regarded by competent observers as of doubtful utility. Probably such a result is the necessary consequence of the enthusiasm engendered by every successful movement—and it may be hoped that the lapse of time will tend to correct any undue activity in the direction indicated.

To sum up, as regards gynæcological progress during the last sixty years in the direction of treatment, the most prominent achievements have been the establishment of ovariotomy and of vaginal hysterectomy, omitting minor operations, while in the way of diagnosis, the improvement of the speculum, the invention of the uterine sound, the introduction of means for dilatation of the cervix uteri in order to examine the endometrium, and the bimanual method for examining the condition of the pelvic organs, stand out as the chief gains to be recorded. The accoucheur of to-day can hardly imagine what his practice would be without anæsthetics and without antiseptics, and similarly the gynæcologist finds a difficulty in realising what his art must have been without these, and with practically no way of investigating his cases except by digital examination of the vagina. Among the instruments that it would seem difficult for any modern operator to dispense with, we think SPENCER WELLS'S artery forceps should certainly be named.

PREVENTIVE MEDICINE: THE PRODUCT OF THE REIGN.

WHEN, perhaps a century hence, the historian sets himself to write of preventive medicine, the reign of QUEEN VICTORIA will occupy a position of no mean degree in the pages of the work. The era has been remarkable in that within its limits preventive medicine has, as we have pointed out, been born. When our beloved QUEEN ascended the Throne in 1837 the pages of the statute book were, from the point of view of preventive medicine, with one exception, unwritten upon, and it is not a little significant that the exception referred to, the Quarantine Act of 1825, should on the eve of the Diamond Jubilee have been erased from the statutes as a vexatious measure no longer to be tolerated. The birth and growth of sanitary science—for preventive medicine can now be justly termed a science—have been in the main the resultant of the concurrent operation of three important factors. These are the development of what must, for the want of a better term, be called the spirit of humanity, which attaches year by year increasing value to human life and well-being; a better appreciation of the economic fact that health is wealth; and last, but in no sense least, an increased knowledge of the laws which govern the spread of infectious diseases—laws which, rightly apprehended, make for health and prolong life. To these three factors may, perhaps, be added a fourth—namely, a relative absence of the disturbing influences of war. It would be an attractive and congenial task to trace here, step by step and in chronological order, the progress which preventive medicine has made during the sixty years of HER MAJESTY'S reign, but we must content ourselves with a brief general survey, which shall form, as it were, a sort of roll-call of the masters in the science and of the works with which their names are and will be associated. In the very year of the QUEEN'S accession to the throne there came into operation an Act which provided for the registration of births, deaths, and marriages, and which formed the starting-point of those "statistical classics" with which the name of WILLIAM FARR will always be gratefully identified. It was, however, the late EDWIN CHADWICK who first entered the lists in the cause of public health, and it was his energetic and persistent efforts which were largely responsible for the memorable Health of Towns Commission and for the placing of the Public Health Act of 1848 upon the statutes, an Act which was quickly followed by others of sanitary import. In his labours CHADWICK was ably supported by such coworkers as SOUTHWOOD SMITH, SUTHERLAND, GUY, ARNOTT, and KAY, and although his reign was but brief the student of public health will always regard him and his coadjutors as the pioneers of the science.

In the year 1847 the city of Liverpool set an excellent example by appointing DUNCAN its first medical officer of health, and to the City of London belongs the honour of having secured in the following year the services of SIMON, who, in 1855, was appointed the medical adviser to the Central Health Authority, for which he laboured with such signal success for well-nigh twenty-one years.



SIR JOHN SIMON.

It may be interesting, too, to call to mind that amongst the first medical officers of health who were appointed and who helped to build up the public health service of this country were BALLARD, BUCHANAN, BRISTOWE, and BURDON SANDERSON; and it has been to the generalship of SIMON, SEATON, BUCHANAN, and now THORNE THORNE, that we are indebted for those highly valuable annual reports of the Medical Department of the Privy Council and of the Local Government Board which have added in so marked a degree to our knowledge of the natural history of infectious diseases and of administrative methods; while on the more philanthropic side of public health we must not neglect to make honourable mention of the work done by such men as SHAFTESBURY, B. W. RICHARDSON, and PEABODY, all of whom in an unofficial

capacity have in a sense pushed forward the work of CHADWICK.

To STEWART and WILLIAM JENNER this branch of science is especially indebted for the differentiation of typhus fever and enteric fever—a differentiation which has been followed by the almost complete elimination of typhus fever from the country and by an enormous reduction of enteric fever; and similarly to SNOW'S historical reports in connexion with the distribution of cholera we must trace our knowledge of the manner in which certain diseases are water-borne. To BUCHANAN we owe a better understanding of the laws which govern the spread and distribution of enteric fever, typhus fever, and phthisis; while W. H. POWER'S remarkable researches have taught us what a high infectivity small-pox possesses, and how that if we would clearly comprehend the laws of epidemiology we must have regard to diseases affecting animals as well as those that affect the human species—a doctrine which surely receives support from the general principles of biology. To THORNE THORNE and POWER we are indebted for much that is now common knowledge in reference to the natural history of diphtheria; and these two observers, together with SHIRLEY MURPHY, have shown us some of the effects of the aggregation of children in the confined spaces of our public elementary schools. BALLARD, who has but recently passed from our midst, has left us his exhaustive researches into the relation of infantile diarrhœa to the temperature of the earth, researches which are being confirmed every day by other observers, and which have opened up fields of investigation in connexion with the vitality and growth of micro-organisms in the soil. It was BALLARD, too, who provided us with what is now the standard work on offensive trades and on effluvium nuisances. As to small-pox we have heard not a little of late, but we must here recall the fact that the Vaccination Acts of 1840-1871 have been passed within the Victorian era, and that during that time EDWARD JENNER'S immortal, though at first empirical, discovery has not only saved thousands from disfigurement or an early grave, but has received its justification in the general preventive inoculation work of PASTEUR and others. In connexion, too, with vaccination we must mention with appreciation the labours of SIMON, SEATON and the Epidemiological Society; as also of BUCHANAN, MCVAIL, and BARRY; and we may, perhaps, express a hope that ere the Victorian era passes into history the blessings of general systematic revaccination may be added to those of primary vaccination. During later years the progress made in isolation hospital accommodation must be recorded, as also must the extension through the operations of compulsory notification of our knowledge of the distribution of infectious diseases. To KOCH, KLEIN, PARSONS, and others we owe a more precise conception of the thermal death point of micro-organisms and of the effect of chemical disinfectants upon such organisms, while PARSONS has taught us much of the natural history of influenza. The variations, cyclical and seasonal, of epidemic diseases is a subject upon which BUCHANAN, MITCHELL, RANSOME, T. W. THOMPSON, and WHITELEGGE have enlightened us; and NETTEN RADCLIFFE has made it easy for the student of Levantine plague and cholera to trace at the present time the progress of these two diseases in the past. The influence of England has made itself felt in matters relative to quarantine in all parts of Europe, and, indeed, of the world, and for this the country is indebted to SIMON, BUCHANAN, and more recently to THORNE THORNE for his able and energetic advocacy of medical inspection as opposed to quarantine at the International Conferences, while in matters affecting the health of the army the names of PARKES and DE CHAUMONT will be remembered with pride by the Army Medical Staff in all parts of the empire. Probably, however, the most remarkable feature, in a public health sense, of this long reign has been the complete revolution of our ideas in respect of infectious diseases by the discoveries as to bacteria and their products, and in this connexion we are called upon to extol with France the genius of PASTEUR and with Germany the work of KOCH. The intensification and attenuation of disease viruses have been the event of recent years, and although the subject is still almost *in embryo* we may hope before long not only to add curative but protective inoculation to our victories over a variety of hitherto practically uncontrolled diseases. Amongst workers in England we recall the eminent services rendered throughout the world by the teachings of LISTER in connexion with antiseptic surgery, and the highly valuable work done by BURDON SANDERSON and KLEIN in the pathology of the infectious diseases. Amongst foreign bacteriologists there crowd in upon us such names as KLEBS, LÖFFLER, EBERTH, GAFFKY, JANOWSKI, BEHRING, KITASATO, DAVAINE, BOSSANO, BRIEGER, FRAENKEL, HAFFKINE, ROUX, YERSIN, and a host of others.

With the mention of these names we must close this necessarily imperfect sketch, but not without insisting upon the fact that the progress of sanitation in the English sense during the Victorian era has been by no means confined to these islands alone. As we have already pointed out, its influence has extended in certain directions all over Europe, but what is perhaps a matter of especial concern to us as Englishmen is that the mother country has sent out to that Greater Britain beyond the seas men like GRESSWELL to Australia, SIMPSON to Calcutta, and more recently GEORGE TURNER to the Cape, there to engraft the principles of English sanitation, and, while preventing in the colonies of the Empire the development of sanitary defects which age has to some extent inflicted upon us at home, to take advantage of the facilities which modern science affords for promoting and protecting the health of our descendants.

THE QUEEN'S REIGN AND THE MATERIAL AND SOCIAL POSITION OF THE MEDICAL PROFESSION.

THE last sixty years have seen great changes in the material and social position of our profession. The QUEEN'S own reminiscences and impressions of the distinguished men who have served her medically would be deeply interesting. Her appreciation of medical service has been always of the keenest and soundest order, and it would be strange indeed if in this just estimate of the profession she were not followed by public opinion. Yet there is a tendency in some minds to represent the public as less appreciative of the profession than it used to be, and the profession itself as less careful of its own methods and less worthy of the respect of the public than it was in former times. Some who hold this opinion might be ready to admit that the select few of the profession from whom HER MAJESTY'S advisers are taken are as worthy and exemplary as any of their predecessors, but would be disposed to maintain that in the rank and file there is a declension in scientific and intellectual standard in professional methods, in manners, and in social status. Such views can only be put forward out of utter and idle ignorance. The profession in point of numbers is probably twice what it was sixty years ago, so that there are twice as many persons to make a livelihood. It is true that the population of these islands has also increased, but the resulting situation is simply competition, and competition means hardship in individual cases, but it means improvement in general standard. In 1876 there were roughly 22,000 medical practitioners on the Register; there are now 34,000. A generation back BENJAMIN BRODIE spoke of the keen competition of the profession. How much more may we recognise it now?

Competition must be allowed for in passing judgment on the profession and its ways, and in trying to estimate its position in a social respect, compared with what it was sixty years ago.

It is easy to adduce any number of facts which go to support the view that in all essential respects the profession has grown in public usefulness and in public esteem. The very numbers of it are a testimony to such a rise. Men in a wealthy age and country do not flock into a declining profession as they have rushed of late into ours. Compared with the growth in influence of other professions, we have every reason to be satisfied with our own. Neither Divinity nor Law are enough to satisfy men now in respect of the great questions which exercise their minds. The evidence of medicine is sought. This may well be so when we consider the length of the medical curriculum and the field of study which has to be covered by those entering the profession. It is still more intelligible when we remember the enormous and rapid development of medicine and surgery during the sixty years which we are all commemorating, accomplished in large part by men in actual practice, and therefore in constant contact with human nature in all its varied moods and conditions. We do not contribute many members to Parliament, but in the constituencies which are responsible for sending members there are few more influential persons than the members of our own profession. They have not yet found out their full influence, and we are thankful to say that politics play no part in professional successes; but when questions of wide popular interest are on the *tapis* the medical vote and word are already of importance and are bound to become more so. The quiet influence of medical men in the municipal and local life of the country is difficult to realise. But that it is very extensive and beneficial is often strikingly illustrated in our columns by the short biographies of men whose names do not perchance appear in the medical journals until we have to record their deaths.

Medical societies have multiplied and grown in prosperity beyond all precedent. Not only in the capitals, but in almost every provincial town of any consequence medical societies exist, where men stimulate each other in the science and art of their profession by the comparison of methods and the interchange of ideas. But the success of these societies only serves to make more apparent the undoubted and regrettable facts that the organisation and the discipline of the profession are sadly incomplete. Almost within the years of HER MAJESTY'S reign a medical association has been established with half the profession in its membership, and this has attained to such a state of prosperity as can only be marred by the unfaithfulness of its best elements. Yet a spirit of general content with a condition which is undoubtedly one of progress is certainly not prevalent. In matters of ethics the profession can take care of itself. The great disciplinary influence of the profession is its own public opinion and the sound and subtle sense of what is honourable among its own members, and the best proof of the efficacy of these agents lies in the infrequency of gross cases of professional misconduct calling for the attention either of the law courts or of the General Medical Council or of the qualifying bodies. But in matters more concerning the worldly prosperity of the rank and file of the profession the leaders take little interest and the masses are divided in counsel. The profession is in some degree abused by the State, and is in no way protected by the State from gross exploitation, and these facts are known, while their remedy is not so obvious. This, however, is a little cloud in the brilliancy of medical affairs in the Victorian era upon which we do not desire to dwell at the present moment. Amid many grievances and disadvantages the profession bears itself with dignity, and establishes itself in the estimation of society and of those who best represent society. Within comparatively recent years leaders of the two great political parties have taken more than one opportunity of expressing their very high estimate of the position and prospects of medicine, while the State in its own interest has of late had to multiply its medical servants, until State medicine has become a special branch of study, fitting men for duties and offices altogether distinct from ordinary medical practice.

This steady and constant rise in the social status of the profession applies to all its branches. The leading medical men of the day hold their ground in any scientific society or in any social gathering. The House of Lords is more complete for having one medical Peer, but it will need several more before it does justice to itself or to the State. We may safely assume that the medical members of the Lower House are likely to increase. But the true rise of the profession is best seen in the fact that with an ever-increasing tendency to specialism the general practitioner stands out as the basis of the pyramid. He has risen and with him the profession has risen. There are those, we believe, who sigh for the old-fashioned apothecary, with his black clothes and his white cravat, and no doubt he was often an extremely respectable old gentleman, with his ready diagnosis and his equally ready medicaments for the few diseases in his nosology. But they must sigh in vain. For men of the type of Mr. PENDENNIS, senior, who "exercised the profession of apothecary and surgeon in the city of Bath, where he not only attended gentlemen in their sick rooms and ladies at the most interesting periods of their lives, but would condescend to sell a brown paper plaster to a farmer's wife across the counter or to vend tooth brushes and London perfumery," are obsolete. For many years they have been a vanishing quantity, and now they are lost to the social scheme, and, on a broad view of the question, it must be admitted that the public conception of medical practice has been raised thereby. The trade element in it is diminishing. Medical life is not an affair of nostrums and draughts and pills, but of intelligence and cultivation and capability. The apothecary has become the general practitioner, and the general practitioner is more and more perfecting his knowledge and his ability.

UNIVERSITY OF CAMBRIDGE.—At the congregation on June 10th the establishment of the new lectureship in Experimental Psychology was carried by 37 votes to 5. The degree of Doctor of Medicine was conferred on Walter Broadbent, M.A., B.C., Trinity; A. S. F. Grünbaum, M.A., B.C., Caius; J. C. Waithman, M.A., Magdalene; and A. L. Jackson, M.A., B.C., Clare. The degrees of Bachelor of Medicine and Bachelor of Surgery were conferred on W. F. Lloyd, B.A., Clare; C. A. Robinson, B.A., Caius; A. P. Beddard, B.A., Trinity; W. Myers, B.A., Caius; and F. F. Ward, B.A., Selwyn. The degree of Bachelor of Surgery was also conferred on Dr. Waithman, Magdalene.

FOREIGN UNIVERSITY INTELLIGENCE.—*Atlanta Medical College:* Dr. Charles Minor Blackford has been appointed Lecturer on Pathology, Bacteriology, and Histology.—*Berlin:* Dr. G. Behrend, *privat-docent* of Dermatology, has been granted the title of Professor.—*Chicago Medical College:* Dr. Henry Gradle has been appointed Professor of Ophthalmology and Otology in succession to Dr. M. S. J. Jones, who has resigned.—*Halle:* Professor Fehling, who had been offered the chair of Midwifery at Tubingen, has decided to remain at Halle.—*Heidelberg:* Dr. Schottländer *privat-docent* of Midwifery has been promoted to an Extraordinary Professorship of that subject.—*Michigan (Ann Arbor University)*: Dr. Arneill has been appointed Assistant Professor of Medicine.—*Vienna:* Dr. Alfred Topolanski, of the ophthalmic department of the hospital connected with the sisters of charity, has been recognised as *privat-docent* in Ophthalmology in the University.

The Lancet Special Commission

ON THE

METROPOLITAN WATER-SUPPLY.

XV.[1]

THE GRAND JUNCTION WATERWORKS COMPANY.

History.—In the year 1798 the Grand Junction Canal Company obtained an Act of Parliament (33 Geo. III., c. 33) to enable them to supply water to the inhabitants of Paddington and the places adjacent. The project was not, however, at once carried out. In November, 1810, an announcement was made in the newspapers that "works are now constructing and reservoirs making, under the direction of Mr. Rennie, the engineer, with powers to effect their purpose far superior to any other in the kingdom, and calculated to give to the inhabitants and streets supplied an abundance of pure and excellent soft water even in the upper stories of houses or other buildings." It was pointed out that the height above the Thames from which the water was to be taken enabled the proprietors to convey it at a very small expense to the parishes of Paddington, Marylebone, and St. George Hanover-square, and to the new streets which were then being built in these neighbourhoods. The advertisement went on to say that the "grand main at present casting" was 30 in. in diameter, and it was announced that a company would be started for carrying out the work as a business distinct from that of the Grand Junction Canal Company. A favourable account was given of the water which was to be supplied, and it was said to be "excellent for all culinary and domestic purposes." "It is also," the prospectus went on to say, "lighter and contains less foreign matter than the Thames water." It was added that additional reservoirs were being made, and streams of water "of the finest quality" were being used, and that there would be a sufficient supply for 40,000 houses. It was obvious, the advertisement stated, that the undertaking would be attended with great public benefit, and the proprietors trusted that they had "reason to feel confident of the liberal support of the public." The Company for carrying out the new undertaking was formed under an Act of Parliament passed in the year 1811 (51 Geo. III., c. 1, 69). The expense of carrying out the undertaking proved to be considerably more than was expected, and the Company at first experienced considerable difficulties with regard to raising new capital when it became necessary to do so. A great deal of money was lost because the Company at first adopted the use of stone pipes, which were recommended by Mr. Rennie. It was soon found that these were very unsuitable for the purpose, and it became necessary to substitute iron pipes. At first the Company obtained their water from the Grand Junction Canal, which in its turn was supplied by the River Colne and River Brent. Water was also obtained from a reservoir of nearly 100 acres, which was filled by streams of the Vale of Ruislip. It was said that these sources were remarkably pure and that the water was superior both in softness and transparency to that derived from the Thames. Experience, however, proved that the water was not by any means perfect, and the directors acknowledged that the quality of the water taken from the canal "had disappointed the expectations of the projectors of the original plan," for it was found to be impossible to keep the land drainage out of the canal, and the Ruislip Reservoir. It was discovered also that the waters of Brent were "so foul that it was necessary to prevent their entering the canal," and a like necessity caused the waters of the Ruislip Reservoir to be conducted by a tunnel under the canal. The supply from both these sources proved unfit for the use of the waterworks. In consequence of this arrangements were made for obtaining water from the Regent's Canal Company, but the supply proved inadequate, and complaints were made both as to the quantity and quality supplied to the customers. The Company at length decided to obtain water from the Thames, and about four acres of land were bought at Chelsea. The site chosen was between the Royal Naval Hospital and the Chelsea Waterworks. The water was obtained through a conduit pipe laid into the bed of the river and was pumped by steam-engines to the station at Paddington, a portion of the site of which is now occupied by Talbot-square and Norfolk-square. There were three reservoirs at Paddington capable of holding 153,000, 139,000, and 65,000 hogsheads respectively. Thames water was allowed to remain for some time to settle before it was pumped for the supply of the customers. The higher parts of the districts were supplied by pumping from Paddington over a standpipe 61 ft. higher than the reservoir, which was 85 ft. above the Thames high-water mark. For the low-service supply the water flowed directly from the reservoirs. In the year 1830 the district supplied was chiefly Paddington and the part between Oxford-street on the north and the Green Park on the south. In the year 1831 the directors of the Company adopted a rather ambitious scheme for supplying the whole of the metropolis with water. It was proposed to supply Middlesex, Surrey, and part of Buckinghamshire, and the scheme included deepening and embanking some miles of the River Colne from its entrance into the Thames near Staines. Water was to be conducted through a canal 27 ft. in width and 4 ft. 6 in. in depth and was to have two footpaths, one on each side. The work would have been one of considerable magnitude. The conduit was to pass over no less than twenty-six rivers, streams, and sewers, over thirty roads, lanes, and footpaths, and one of the aqueducts, it was said, would have been about three times the length of Blackfriars Bridge. There were also to be two tunnels, each 1000 ft in length. The Bill for carrying out the project was referred to a committee of the House of Commons in April, 1831, and it was not passed. In the year 1835 the Company was authorised to remove their intake from the Thames at Chelsea to Brentford, just above Kew Bridge. In 1852 an Act was passed compelling the metropolitan water companies to take their supply from some part above the tidal river, and an Act was therefore obtained to enable the Company to remove their station to Sunbury.

Present state: general description.—The Grand Junction Waterworks Company supplies Sunbury, Hampton, Teddington, Hounslow, Sutton, Isleworth, Brentford, Hanwell, Ealing, Acton, Shepherd's Bush, Notting-hill, part of Bayswater, Paddington, Hyde Park, and Mayfair. The water is derived chiefly from the Thames at Hampton, but a small quantity is obtained from the gravel beds there. The Company's stations are—Hampton intake, arrangement for taking water from the gravel bed, reservoirs, filter beds, pumping station; Kew Bridge, Brentford, reservoirs, filter beds, and pumping station; Hanger-hill, Ealing, reservoirs, pumping station; Campden-hill, reservoirs, pumping station.

Hampton (see Fig. 1).—The Hampton station is situated in the parishes of Hampton and Sunbury, Middlesex, between the upper Sunbury-road and the Thames. Several alterations are in progress here. As in the case of the Southwark and Vauxhall Waterworks, a map is given showing the part of the station in which changes are going on, and it may be best to briefly describe the general arrangements of the station before going into detail. At the eastern extremity of the works there is an engine-house marked E on the plan, and next to this the part cross shaded, marked A, is an old reservoir which is now in progress of conversion into filter beds; further to the west is a covered reservoir, R C; five filter beds, marked F 1 to 5; and a small engine-house G. Still further to the west there is a reservoir R; beyond this another engine-house, having to the north of it a preliminary filter bed, F 6. At the part marked B another preliminary filter is being converted into two beds of the ordinary type. F 7 and F 8 are preliminary filters. The land immediately to the west of these belongs to the Southwark and Vauxhall Company,[2] and beyond this, in the part marked I, there is an arrangement for filtering river water through gravel beds. Immediately to the south of this on the island is the new intake of the Company; DD shows the old intake. With regard to the pumping arrangements, it may for the sake of clearness be best to say in this place that the work to be done is of three kinds. Firstly, water has to be pumped from the river to the filter-beds. Secondly,

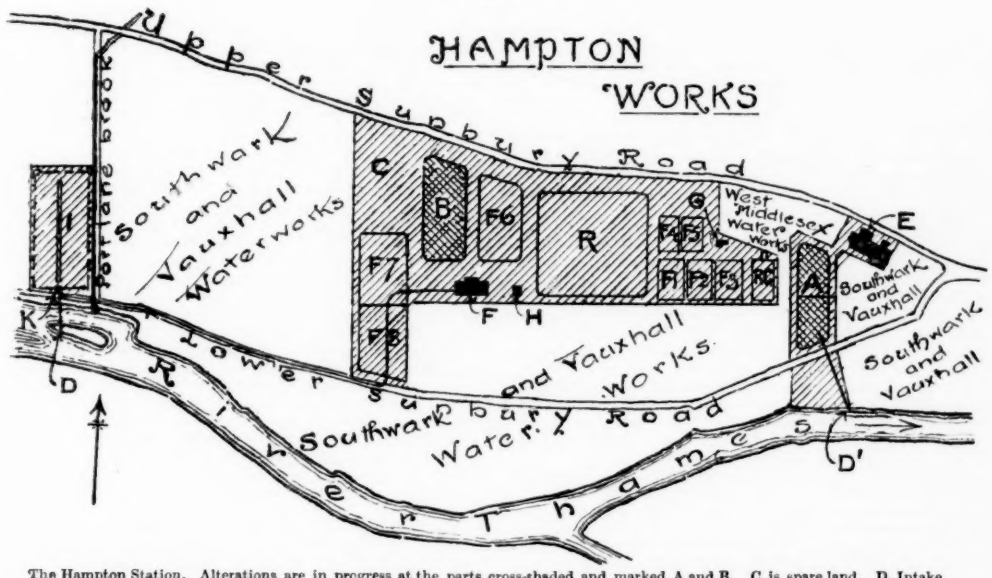
[1] Nos. I., II., III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., and XIV. were published in THE LANCET of Feb. 20th and 27th, March 6th, 13th, 20th, and 27th, April 3rd, 17th, and 24th, May 1st, 8th, 15th, 22nd, and 29th, respectively.

[2] It is the part marked E, Fig. 1, THE LANCET, March 20th, 1897, Article V.

water after filtration here is pumped directly for the country district. Thirdly, water is pumped to Kew Bridge, where it is filtered for the supply of the London district. Roughly speaking, the amount of the local supply is 6,000,000 gallons, and the amount pumped to Kew Bridge is 14,000,000 gallons daily.

Intakes.—The chief intake of the Company is from the Thames, and is situated on a small island which is separated from the Middlesex shore by a backwater about 20 yards in width. At the part of the bank at which the water is taken there is a bay about 40 ft. across, and the intake is protected by a floating boom. There are four gratings formed of bars, which are placed about 3 in. apart, and the depth of the gratings is 2 ft. 6 in. These are cleared as occasion requires. In the autumn, when the river contains a large number of dead leaves, it is found necessary to keep a man constantly at work at it, but at other times the boom keeps off most of the débris. Through the gratings the water flows into a chamber, of which the walls are some feet above the highest flood level, so that it is possible to go there whatever the state of the river may be. The height of the walls of the chamber is 11 ft. above the mean summer level of the river, its size is 24 ft. by 6ft., and there is a grating at the top. Into the chamber situated to the west the water passes through three 30-in. sluices, and after going through the chamber it is continued across the backwater in two 30-in. pipes. On the foreshore there is an inspection chamber (Fig. 1, K.), 6 ft. by 18ft. inside measurement. The water is received into this, and is then conducted to the engine-house (F) by two 36-in. pipes. A second intake from the Thames on the island conducts the water into a smaller reception chamber, which is situated on the eastern side, and adjoining the one just described. The chamber is separated from the other by a brick wall. On the island three layers of open jointed pipes were placed to receive water from the layer of ballast which is situated there. The line of pipes is about 8 ft. below the mean summer level of the river. Two of these lines of pipes are still in working order, but it is found that very little water is collected by them except in flood time. The water thus collected passes into the chamber with that taken from the river, and is then conducted to the main land across the backwater through a 30-in. pipe. On the foreshore there is another arrangement for collecting water from the ballast. A line about 50 yards in length of 24-in. pipes is laid with open joints at a depth of about 8 ft. below the mean summer level. The water thus collected from the ballast on the island, the water taken from the Thames, and the water collected from the foreshore in the pipes just described is conducted through a 30-in. pipe to an engine-house H. A certain amount of water is also obtained by a special arrangement situated in a meadow marked I just to the north of the Lower Sunbury-road, and this water passes with that derived from the sources just mentioned. The old intake marked D is situated between those of the Southwark and Vauxhall and the West Middlesex Companies, and from this source water is taken for the supply of the filter beds.

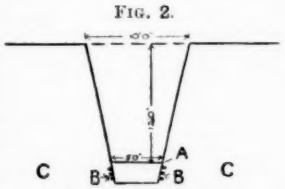
FIG. 1.



The Hampton Station. Alterations are in progress at the parts cross-shaded and marked A and B. C is spare land. D, Intake on the island. D', Old intake. E, Engine-house. F, Reidler engine-house. F 6, F 7, F 8, Preliminary filter beds. F 1, F 2, F 3, F 4, F 5, Filter beds for the local supply. G, House for diagonal engine. H, House for horizontal engines. I, Meadow containing arrangements for collection of gravel water. K, Inspection chamber. R, Reservoir. R C, Covered reservoir.

Gravel water system.—From the foreshore inspection chamber which has been described a 24-in. iron pipe conveys the water for a distance of about 40 yards to the meadow, passing in its course under the Lower Sunbury-road and conducting it into a filter screen. The filter screen is an arrangement of unusual character. A trench (see Fig. 2) 12 ft. in depth and 60 yards in length was dug in the meadow; the lower part of the trench is 6 ft. in width, and the upper part 10 ft.; the sides are concreted to a depth of about 15 ft. from the surface, but the lowest part is perforated by small drainage-pipes. The bottom of the trench is filled with washed and screened ballast and fine shingle to a depth of 3 ft. The

FIG. 2.



The trench in section.

FIG. 3.

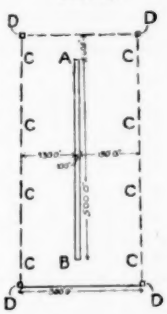


Diagram of section of filter screen.

water flows in by gravitation from the inspection chamber, and its height is regulated by a cock. As a rule it is kept at about 1 ft. below that of the mean summer level of the river, and as the surface of the filter screens is 2 ft. below this the depth of water above the screen is of course about 1 ft. The water which covers the filter screen gradually percolates through the filter screen and then into the ballast which is situated in the meadow, and after passing for about 150 ft. or so through this natural filter it is collected by a layer of pipes which were laid in the ballast for that purpose. This series of collecting pipes surrounds the filter trench (see Fig. 3 C C). The pipes are situated 12 ft. below the mean summer level; they are of earthenware, 24 in. in diameter, and are laid with open joints. They conduct the water to two brick shafts (see Fig. 3 B) which are in a line with the 30 in. main, and the water passes from them into this main. The surface of the filter screen is cleaned in the same way as that of an ordinary filter—that is to say, the surface is skimmed off to a depth of about 1 in. every month or so.

Pumping arrangements.—The water passes by gravitation through the two 36-in. pipes previously described to an engine-house called the Reidler House, marked F on the map. It is pumped thence either to the reservoir (see Fig. 1, R) or to the preliminary filter-beds (see Fig. 1, F, 6, 7, 8).

Engine-house.—The engine-house contains two pairs of Reidler engines, one pair high lift and the other low lift, a centrifugal and Worthington engine. The low-lift Reidler engines pump the water into the reservoir R and into the preliminary filter-beds, F 6, 7, 8. The centrifugal engine is used for the same purpose. The high-lift Reidler engines pump the water from the preliminary filters and from the reservoir to Kew Bridge. The Worthington engine is used for the same purpose.

Low-lift Reidler engine.—This engine has cylinders of 11 in. and 20 in. and a stroke of 27 in. It works double-action plunger pumps, the cylinders of which have a diameter of 23 in. It therefore lifts 165 gallons per stroke and it is worked at the rate of sixty revolutions a minute.

High-lift Reidler engine.—This engine has cylinders with diameters of 21 in. and 39 in. and a stroke of 36 in. The diameter of the pump cylinder is 20 in. It is worked at a rate of sixty revolutions per minute.

The Worthington engine has cylinders 9½ in., 14 in., and 25 in., and a stroke of 2 ft. 3 in. It works a plunger pump which has a cylinder 30 in. in diameter. It pumps 48 gallons per stroke, and the number of revolutions is from 45 to 50. These engines are worked by seven Lancashire boilers at a pressure of 90 lb. The head of water worked against in pumping to the reservoir is 28 ft., and in pumping to Kew 130 ft.

Horizontal engine-house.—This house contains two horizontal engines having cylinders of from 16 in. to 21 in. in diameter respectively. These work three-throw pumps, which raise the water brought from the river and the gravel-beds through the 30-in. pipe, and raise it to the reservoir and to the filters which are used for the local supply. The pumping capacity is 11,000,000 gallons per day, but about 4,000,000 gallons only are usually required.

Filters.—Preliminary filter, F 6. This has an area of three acres, and it is surrounded by a puddle wall taken down to the London clay. The filtering material consists of 2 ft. of sand and 4 ft. of screened ballast. The filtered water is collected by three 24-in. earthenware pipes which conduct it to the Reidler engine-house. There are no cross drains.

Preliminary filter beds (F 7 and 8).—There are two beds called "preliminary" filter beds, each of which has an area of about one and three-quarter acres. The upper parts are lined with blue Staffordshire bricks, the upper 2 ft. of the walls are vertical, and the lower part is formed of concrete at a slope of two and a half to one. The bed of the filter is formed as follows: Sand 2 ft. 6 in., ballast 1 ft. 6 in. to 2 ft. The ballast is thicker at the centre than at the sides of the bed, and the floor slopes gradually towards the centre, where it is 6 in. deeper than it is at the sides. When cleansed the sand is reduced in thickness from 2 ft. 6 in. to 2 ft. The filtered water is collected in earthenware pipes 12 in. in diameter, which are laid with open joints and conduct the water into a central culvert.

Storage reservoir (See Fig. 1 R).—This reservoir covers an area of about ten acres, the upper part is lined with blue Staffordshire bricks, and the walls, which are built of concrete, have a slope of 3 to 1. It is surrounded by a puddle trench, which goes down to the London clay. The reservoir is 22 ft. deep, and is said to be capable of storing 45,000,000 gallons of water. The water for the supply of this reservoir comes from the river in part through a 36-in. main, and gravel water is also pumped here.

Water for the London district is pumped from Hampton to Kew and filtered there; for the local supply the water is filtered at Hampton and distributed directly to the district.

Filter beds.—The five filter beds which are used for the local supply (see Fig. 1, F 1 to F 5) have an area of three-quarters of an acre each. They are of oblong form; the upper part is lined with Staffordshire bricks. The walls of No. 4 and No. 5 are nearly vertical. The filtering material is formed of 2 ft. 6 in. of sand and 2 ft. of shingle. For the collection of the filtered water there is a central culvert, of which the sides are built in part with perforated bricks to allow the passage into it of the filtered water. The upper part of the culvert has stone covers. Water is conducted to its perforated sides through land drain pipes 2 in. in diameter. These filter beds have no ventilators. The sides of beds Nos. 1, 2, and 3 have a slope of 2 to 1. In other respects they are similar to filters 4 and 5.

Cleansing filter beds.—As a rule filter beds are cleansed once a month and in early spring more frequently. The sand is always washed by means of an apparatus made of cast iron hoppers with ejectors. The pressure of the water used is about 150 ft. It is found that 4500 gallons of water are used in washing a cubic yard of sand. When the sand was washed by means of high pressure without this hopper arrangement no less than 7000 gallons of water were used in washing a cubic yard. The sand is very efficiently washed by the arrangement in use at this station.

The rate of filtration.—The maximum rate of filtration is 2½ gallons per square foot per hour. As a rule the rate is 1¼ gallons per square foot per hour.

Pumping arrangements for the country district.—For the local supply of water a diagonal engine situated in a house marked G and two pairs of beam engines are used. The diagonal engine is one of unusual form—is capable of pumping 176 gallons per stroke and works at a rate of 14 per minute. The steam for working the engine is generated by three Lancashire boilers, and the pressure used is 80 lb.

Covered reservoir.—There is a reservoir covered by concrete arches built on steel girders which are supported by brick piles. This reservoir is capable of storing 3,000,000 gallons. The water from it is used entirely for the local supply. It passes to the engine-house (marked E) and is pumped by the beam engines.

Engine-house (E on map).—The western part of the engine-house contains two beam engines, which have cylinders 24 in. and 48 in. in diameter, and a stroke of 8 ft. This works bucket and plunger pumps; the diameter of the bucket is 29½ in. and that of the plunger 21 in. The steam pressure used is 60 lb. The head of water worked against is 150 ft. The pump discharges 236 gallons per stroke and the rate is about 12 per minute. There is an electrical communication between this house and Hampton Court Palace. The Company have arranged to supply water there in case of fire. The engine is worked by four Lancashire boilers at a pressure of 60 lb.

Bull engines.—There are three direct acting Cornish engines of the Bull type. Of these one has cylinders of 70 in. in diameter, and two have cylinders of 68 in. These engines were formerly constantly used for pumping water to Kew, but they have not been much used since the erection of the Reidler engines in 1891. Of these engines two are capable of pumping 559 gallons per stroke, and were worked at a rate of about twelve a minute, and the other is capable of pumping 695 gallons per stroke, and was worked at a rate of about eleven strokes per minute. The steam for these engines was supplied by four Cornish boilers at a pressure of 40 lb.

The course of mains from Hampton to Brentford.—A single 33-in. main conveys the water through Twickenham and Isleworth. The course of the main is along the high road. From Isleworth—that is to say, for the last two miles—the water is conducted in two 33-in. mains.

(To be continued.)

THE Chinese Government has conferred on Mr. David Craigil Gray, M.B., C.M. Glasg., the Order of the Double Dragon in recognition of services rendered to the Chinese wounded during the late war with Japan. This Order entitles him to the rank of a Third Button mandarin.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AN ordinary meeting of the Council was held on June 10th, the President, Sir WILLIAM MACCORMAC, being in the chair.

Sir James Paget, F.R.S., and Lord Lister, P.R.S., were introduced, and the President presented to each the honorary medal of the College, with a document declaratory of the award thereof.

Mr. Charles Sissmore Tomes, F.R.S., was introduced, and the President handed him a cheque for the amount of the John Tomes Prize, with a document declaratory of the award.

In accordance with the recommendation of the Board of Examiners in Dental Surgery, the Council added the Sheffield Royal Hospital to the list of hospitals the dental departments of which are recognised for dental hospital practice.

The Library Committee were directed to advertise the vacancy in the office of librarian, to consider the applications, and to nominate a candidate to the Council for election.

A report from the Laboratories Committee was adopted; it was as follows:—

"1. *The work on Diphtheric for the Metropolitan Asylums Board.*—The Preparation of Antitoxin Serum. Since March 5th the director has supplied 3125 doses of antitoxic serum containing 4000 units each, 944 doses containing 3000 units each, and 50 doses containing 1000 units, for the treatment of diphtheria in the hospitals of the Metropolitan Asylums Board, and all the demands have been fully met. During this period 15,382,000 units have been supplied, against 14,028,000 units last quarter, being an increase of 1,354,000 units.

"2. *Researches in connexion with the Grant from the Goldsmiths' Company.*—Dr. Cartwright Wood and Dr. T. G. Brodie have continued their investigations, but as yet have nothing further to report. In fulfilment of one of the conditions of the grant from the Goldsmiths' Company, that antitoxin should be, if possible, supplied for use amongst the poorer classes of the community, antitoxic serum has continued to be supplied to various general and children's hospitals in London during the past quarter, as well as to certain medical practitioners for cases fulfilling the necessary conditions."

The Council proceeded to appoint the following examiners for the ensuing year:—Elementary Biology: J. B. P. Beale, George A. Buckmaster, Thomas W. Shore, and Thomas G. Stevens. Anatomy under the Conjoint Board: Stanley Boyd, W. Bruce Clarke, George H. Makins, and Arthur Robinson. Physiology under the Conjoint Board: John R. Bradford, Leonard E. Hill, and Walter G. Spencer. Anatomy for the Fellowship: William F. Haslam, Walter H. A. Jacobson, Charles B. Lockwood, and John Bland Sutton. Physiology for the Fellowship: Thomas G. Brodie, D'Arcy Power, Ernest H. Starling, and William H. Thompson. Midwifery under the Conjoint Board: Montagu Handfield-Jones, Arthur H. N. Lewers, Amand Routh, and Herbert R. Spencer. Public Health: Part I., Arthur P. Luff; Part II., Edward Seaton.

The committee which had been appointed to consider a memorial signed by forty-one members of the medical profession resident in Norwich, asking for the advice and guidance of the Council on the question of meeting in consultation the medical officers of the Norwich Medical Institute, and which had also received a deputation from the medical profession in Norwich, presented a report, and it was resolved that—

"The Council, having considered the memorial of members of the medical profession in Norwich and the additional statements made by the deputation from Norwich, are of opinion that the disciplinary powers provided by Section XVI. of the by-laws do not entitle the Council to call in question the legality of Fellows and Members of the College holding the appointment of medical officer to the Norwich Medical Institute or to similar institutions, and therefore they cannot endorse the refusal of any of its Fellows and Members to meet in consultation (particularly in urgent cases) registered practitioners when acting in conformity with their legal rights."

In reply to a letter from Dr. Frederick Pearse, the honorary secretary of the Portsmouth Medical Union, asking whether the College were prepared to take action against its Members for employing men to "tout" and canvass from door to door for them, the following reply was directed to be sent:—

"The Council, while not prepared to express an abstract opinion on the question raised by the Portsmouth Medical Union, are willing to consider any evidence which may be submitted to them respecting canvassing for patients either directly or indirectly by any individual Fellow or Member of the College with a view to determining whether or not such Fellow or Member has been guilty of a breach of the by-laws."

A letter was read from Mr. J. H. Square May pointing out that the reply of the Council to the memorial from Members and Fellows of the College in Plymouth on behalf of Mr. R. B. Anderson does not allude to the request that the Council should explain why Mr. Anderson's case does not come under By-law XV., and asking for an explanation on this point. The Council resolved: "That Mr. May be informed that the Council do not consider it is incumbent upon them to give explanations of the conclusions at which they may arrive, but are of opinion that Mr. Anderson's case does not come within the terms of Section XV. of the by-laws." A letter was read from Mr. Thomas Bryant reporting the proceedings of the General Medical Council at their late session. The best thanks of the Council were voted to Mr. Bryant for his services as the representative of the College on the General Medical Council.

The candidates for the vacant places on the Council of the Royal College of Surgeons of England are:—

	Member.	Fellow.
Howse, Henry Greenway	1865	1868
Cousins, John Ward	1856	1860
Owen, Edmund Blackett	1868	1872
Godlee, Rickman John	1872	1876
Cheyne, William Watson	1879	1879
Lucas, Richard Clement	1868	1871
Morgan, John Hammond	1872	1876
Dalby, William Bartlett	1867	1870
Jackson, George...	1864	1876
May, Bennett	1868	1876
Clark, Andrew	1869	1873

There are five vacancies. Mr. Howse and Dr. Ward Cousins seek re-election.

THE SOCIETY OF MEMBERS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND AND LORD LISTER.

THE following letter to Lord Lister has been enclosed to us for publication by Mr. George Jackson and Mr. R. B. Anderson, with a note to the effect that "did time permit the letter would be numerously and influentially signed, but the importance and correctness of the principles submitted will not," the writers trust, "depend in Lord Lister's estimation on those who thus inadequately represent them."

[ENCLOSURE.]

10, Portland-villas, Plymouth, May 10th, 1897.

To the Lord Lister, F.R.C.S. Eng., &c., &c., &c.

YOUR LORDSHIP,—As the Fellows' Association will not take action on the occasion of the approaching election of members of Council of the College of Surgeons, the Society of Members of the College is desirous of obtaining the support of independent candidates and electors to the claims of the Members for a reform of the College—e.g., (1) for a moderate representation of the Members on the College Council; (2) for the right to assist in electing the President of the College; (3) for the fulfilment of its undertaking given by the Council in Section XV. of the by-laws to "protect and defend" "Fellows and Members" who "may be disturbed" in the exercise "of rights acquired by them as Fellows and Members" or as "Members"; and (4) for the right to assist in choosing the representative of the College on the General Medical Council.

These measures have, to a greater or less extent, been advocated amongst the Fellows up to this period; and some have been received with favour. We believe a large proportion of the five hundred Fellows who on the issues as hitherto unfavourably and inadequately set before them have not voted would support a definite policy of reform, to be carried with spirit to an early issue, besides two hundred who have voted for a moderate extension of the franchise to the Members. Should it be found that the Fellows, as a body, reject the just claims of the Members, the latter contemplate moving in Parliament for an Act to reform the corporation. In case your views are in favour of such a policy of justice and conciliation towards those who are the corporation, and of whom, though Fellows, we ourselves are units, we venture to invite you on behalf of reform, though without asking you for any present expression on the subject, to permit yourself to be placed in nomination for the approaching election to the College Council. You would then be in the best position as the movement advances to aid it by your great influence in such respects as you may deem wise and salutary.

We have the honour to be, your Lordship's most obedient servants,

C. B. KEETLEY, R. B. ANDERSON,
GEO. JACKSON, SYDNEY JONES.

ANNUAL DINNER OF THE ARMY MEDICAL STAFF.

THE annual dinner of the Army Medical Staff was held on Monday last at the Whitehall Rooms of the Hôtel Métropole. The meeting was in every respect a pleasant one, and, as has been the custom in late years, there was no post-prandial oratory, the only toast given being that of the Health of Her Majesty the Queen. We may note that among some communications read by the Chairman was one expressive of good wishes from medical officers serving at Canea. The following are the names of the officers and their guests:—Surgeon-Major-Generals: Director General J. Jameson (in chair), A. F. Bradshaw, C.B., C.M. McD. Cuffe, C.B, Sir J. Fayrer, K.C.S.I., G. L. Hinde, C.B., J. Inkson, W. Nash, T. F. O'Dwyer, A. F. Preston, J. B. C. Reade, C.B., W. Taylor, W. M. Webb, and J. Warren. Surgeon-Colonels: O. Codrington, H. Cayley, W. G. Don, H. C. Herbert, C. H. Harvey, J. H. Hughes, J. H. Jeffcoat, C. M. Jessop, T. Ligertwood, J. Maturin, J. L. Notter, T. O'Farrell, W. Sly, and J. Watts. Brigade-Surgeon-Lieutenant-Colonels: W. B. Allin, B. M. Blennerhassett, C.M.G., J. F. Beattie, J. A. Clery, R. de la C. Corbett, W. Donovan, W. J. Fawcett, T. J. Gallwey, C.B., W. L. Gubbins, L. A. Irving, W. Keir, C. Mackinnon, H. Mackinnon, D.S.O, W. McNalty, A. A. Macrobin and W. Temple, V.C. Surgeon-Lieutenant-Colonels: J. A. Anderson, F. E. Barrow, U. J. Bourke, W. C. Chester, A. Doig, J. B. Emerson, J. Hector, G. A. Hughes, J. G. Leask, G. H. Le Mottée, R. H. Quill, A. B. Robinson, and T. Wright. Surgeon-Majors: F. M. Baker, J. Battersby, W. G. Bedford, A. E. J. Croly, A. Dodd, J. R. Dodd, H. Grier, F. A. Harris, J. L. Hall, J. G. Harwood, R. J. Hackett, H. E. R. James, R. Jennings, S. F. Lougheed, R. E. R. Morse, W. G. Macpherson, H. W. Murray, F. B. Maclean, C. G. D. Mosse, F. P. Nichols, E. North, R. Porter, G. W. Robinson, G. H. Sylvester, J. Tidbury, G. Wilson, and T. P. Woodhouse. Surgeon-Captains: C. H. Hale, D.S.O., H. St. G. Hore, E. M. Hassard, O. R. Julian, J. C. Jameson, R. E. Kelly, W. B. Leishman, F. J. Morgan, J. A. O. McCarthy, J. Paterson, O. L. Robinson, R. J. Windle. Captain and Quartermaster: D. J. Gillman.

The following guests were present: The President of the Royal College of Surgeons of England (Sir W. MacCormac), the President of the Indian Medical Board (Surgeon-Major-General Hooper), Surgeon-Major W. Collingridge, Militia Medical Staff Corps, Mr. Vesey Holt, and Mr. Thomas Wakley, Jun.

THE ROYAL SOCIETY CONVERSAZIONE.

"LADIES' NIGHT" at the Royal Society is, as a rule, made more attractive than the first exhibition of the year, and the demonstration and reception held on Wednesday last proved to be no exception to this rule. Pure science yields to some extent to popular science. Fittingly enough the visitors were met with a unique design in the entrance hall consisting of the words "Vivat Victoria Regina" displayed in a beautiful series of argon and helion tubes. Of course, Professor Ramsay was responsible for this beautiful display. It illustrated a pretty application of the properties of two important elements discovered only recently in this remarkable Victorian period. Perhaps the most fascinating subject of demonstration was that for which Messrs. Preece and Marconi were jointly responsible. At this exhibit was demonstrated with remarkable success the possibility of transmitting intelligence by means of electric waves, without the ordinary channel of wires, but simply with the ætheriferous medium which pervades all space. In the method shown electrical vibrations are set up by an electrical machine like an ordinary induction coil, which are caught up by a receiver some distance away. In thus bombarding the receiver, a bell is made to ring, and by the varying frequency of the ringing a message may be deciphered. The electric waves produced vibrate at the rate of at least 250,000,000 beats per second. The vibrations, indeed, are so rapid as to permeate rapidly through opaque substances, as, for instance, through brick walls. This fact promises to introduce possibilities of far more reaching consequence than even the x rays. It was further demonstrated that there might exist sufficient electrical disturbance in the muscles of the human body to actuate the instrument. Will this wonderful result afford a working basis for telepathy? By the method described communication was established between the islands and the mainland in the Bristol Channel, but at the Royal Society's rooms the demonstration was limited to an intervening space of some thirty feet. It was none the less convincing of a probable practical success in the future. Some experiments of extreme interest, and illustrating further developments in cathode rays, were shown by Mr. A. A. C. Swinton, Professor Silvanus P. Thompson, and Dr. Macintyre. The last-named gentleman exhibited a series of x ray kinematographic films showing in a beautiful and interesting manner the movements of the joints and sockets in a frog. A pretty effect was produced by Lord Kelvin in illustrating the production of electric conduction through air under the influence of uranium. Uranium salts have the peculiar and apparently inexhaustible property, too, of emitting rays of a similar character and frequency to the x rays, and analogous photographic effects may thus be produced. As to the rest of the exhibits they were, speaking generally, a repetition of the former exhibition, an account of which was published in THE LANCET of May 22nd. Thus examples of the recent advances in colour photography were shown, and the remarkable phenomenon of "commensalism" occurring amongst marine animals was again illustrated by the Marine Biological Association, whilst the pretty optical experiments exhibited by Mr. Shelford Bidwell and Mr. C. P. Butler were once more in evidence.

The President, Lord Lister, received the lady visitors and the Fellows, the company being a very large one, and including, as might have been anticipated, several distinguished persons who are present in England to attend the Diamond Jubilee.

THE PRINCE OF WALES'S HOSPITAL FUND: SOUVENIR OF THE QUEEN'S COMMEMORATION.

THERE will be many souvenirs, which will hand down to posterity the remembrance of this *annus mirabilis* of the British Empire, but among the most interesting of the records of the commemoration pageant will assuredly be that which was issued yesterday (Thursday), by the proprietors of the *Graphic* and *Daily Graphic*, under the auspices of the Prince of Wales's Hospital Fund and by authority of the Prince himself. We refer to the illustrated programme of the Royal Jubilee procession, the publication of which we have already advocated. The book is excellently got up and authentic in detail, as those in authority, knowing the object to which the results of all sales would be devoted and the interest Her Majesty takes in that object, have given the artists all possible facilities. We consider that the possession of this illustrated guide to Tuesday's pageant is almost a necessity to those who desire to understand the significance of the gorgeousness which will fill their eyes.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN thirty-three of the largest English towns 5492 births and 3297 deaths were registered during the week ending June 12th. The annual rate of mortality in these towns, which had been 16·6 and 17·4 per 1000 in the two preceding weeks, declined again last week to 15·6. In London the rate was 13·8 per 1000, while it averaged 16·9 in the thirty-two provincial towns. The lowest death-rates in these towns were 8·2 in Croydon, 10·7 in Brighton, 12·0 in Swansea, and 12·3 in Huddersfield and in Plymouth; the highest rates were 20·3 in Manchester, 20·6 in Bolton and in Gateshead, 21·1 in Liverpool, and 23·7 in Salford. The 3297 deaths in these towns included 379 which were referred to the principal zymotic diseases, against 355 and 364 in

the two preceding weeks; of these, 131 resulted from measles, 90 from whooping-cough, 57 from diphtheria, 48 from diarrhœa, 28 from scarlet fever, 24 from "fever" (principally enteric), and one from small-pox. No death from any of these diseases was recorded last week in Plymouth or in Derby; in the other towns they caused the lowest death-rates in Croydon and Bristol, and the highest rates in Liverpool, Bolton, Sunderland, Burnley, and Salford. The greatest mortality from measles occurred in Manchester, Burnley, Birkenhead, Bolton, and Salford; and from whooping-cough in Burnley, Liverpool, and Sunderland. The mortality from scarlet fever and from "fever" showed no marked excess in any of the large towns. The 57 deaths from diphtheria included 39 in London, 3 in Birmingham, and 3 in Sheffield. One fatal case of small-pox was registered in London, but not one in any other of the thirty-three large towns. There were 2 cases of small-pox under treatment in the Metropolitan Asylum Hospitals on Saturday last, June 12th, against 13, 12, and 4 at the end of the three preceding weeks; no new cases were admitted during the week. The number of scarlet fever patients in the Metropolitan Asylum Hospitals and in the London Fever Hospital at the end of the week was 2637, against numbers increasing from 2380 to 2601 on the six preceding Saturdays; 255 new cases were admitted during the week, against 311, 278, and 274 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 196 and 229 in the two preceding weeks, declined again last week to 191, and were 60 below the corrected average. The causes of 45, or 1·4 per cent., of the deaths in the thirty-three towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Bristol, Leicester, Nottingham, Newcastle-upon-Tyne, and in eleven other smaller towns; the largest proportions of uncertified deaths were registered in West Ham, Birmingham, and Liverpool.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had declined in the three preceding weeks from 22·3 to 20·3 per 1000, was again 20·3 during the week ending June 12th, and exceeded by 4·7 per 1000 the mean rate during the same period in the thirty-three large English towns. The rates in the eight Scotch towns ranged from 11·7 in Aberdeen and 16·1 in Greenock to 24·9 in Leith and 26·3 in Edinburgh. The 606 deaths in these towns included 37 which were referred to whooping-cough, 27 to measles, 15 to diarrhœa, 8 to "fever," 4 to scarlet fever, 2 to diphtheria, and 1 to small-pox. In all, 94 deaths resulted from these principal zymotic diseases, against 91 and 93 in the two preceding weeks. These 94 deaths were equal to an annual rate of 3·2 per 1000, which was 1·4 above the mean rate last week from the same diseases in the thirty-three large English towns. The fatal cases of whooping-cough, which had been 34 and 40 in the two preceding weeks, declined again to 37 last week, and included 14 in Glasgow, 10 in Edinburgh, and 9 in Leith. The deaths from measles, which had been 24 and 30 in the two preceding weeks, were 27 last week, of which 15 occurred in Edinburgh, 7 in Glasgow, and 4 in Leith. The 8 deaths referred to different forms of "fever" considerably exceeded the number recorded in any recent week, and included 6 in Glasgow and 2 in Dundee. The fatal cases of scarlet fever, which had declined from 6 to 2 in the four preceding weeks, rose again to 4 last week, of which 3 occurred in Edinburgh. The deaths referred to diseases of the respiratory organs in these towns, which had been 128 and 110 in the two preceding weeks, further declined to 108 last week, but exceeded by 15 the number in the corresponding week of last year. The causes of 39, or more than 6 per cent., of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 28·3 and 28·2 per 1000 in the two preceding weeks, further declined to 22·4 during the week ending June 12th. During the past ten weeks of the current quarter the death-rate in the city has averaged 29·3 per 1000, the rate during the same period being 15·9 in London and 26·3 in Edinburgh. The 150 deaths registered in Dublin during the week under notice showed a decline of 19 from the number in the preceding week, and included 14 which were referred to the principal zymotic diseases, against 15 and 10 in the two preceding weeks; of these, 4 resulted from scarlet fever, 4 from whooping-cough, 2 from measles, 2 from "fever," 1 from diphtheria, and 1 from diarrhœa. These 14 deaths were equal to an annual rate of 2·1 per 1000, the zymotic death-rate during the same period being 1·5 in London and 5·2 in Edinburgh. The fatal cases of scarlet fever, which had been 3 and 2 in the two preceding weeks, rose again to 4 last week. The 4 deaths referred to whooping-cough showed a slight further increase upon the numbers recorded in recent weeks; and the 2 fatal cases of measles showed a further decline. The 150 deaths in Dublin last week included 25 of infants under one year of age, and 35 of persons aged upwards of sixty years; the deaths both of infants and of elderly persons showed a further decline from the numbers recorded in recent weeks. Ten inquest cases and 9 deaths from violence were registered; and 56, or more than a third, of the deaths occurred in public institutions. The causes of 8, or more than 5 per cent., of the deaths in the city last week were not certified.

THE SERVICES.

ARMY MEDICAL STAFF.

SURGEON-CAPTAIN WILLIAM J. CROFTON, half-pay, is placed on retired pay.

INDIA AND THE INDIAN MEDICAL SERVICES.

Surgeon-Lieutenant-Colonel Haliday, Bombay Establishment, 13th Regiment of Bombay Infantry, has been permitted by the Secretary of State for India to retire from the service. Surgeon-Major C. M. Thompson succeeds Surgeon-Lieutenant-Colonel H. D. Cook as Medical Officer at Octacamund. The services of Surgeon-Captain Mason, A.M.S., are placed temporarily at the disposal of the Government of Bombay for employment on plague duty.

ARMY MEDICAL RESERVE OF OFFICERS.

The under-mentioned Surgeon-Captains to be Surgeon-Majors:—Q. Chalmers, and J. J. de Zouch Marshall. Surgeon-Captain Harry Thornton Challis, 4th Volunteer Battalion the Essex Regiment, to be Surgeon-Captain.

VOLUNTEER CORPS.

Rifle: 1st (Hallamshire) Volunteer Battalion the York and Lancaster Regiment: Surgeon-Lieutenant J. Hamel, M.B., resigns his commission. 3rd (Sunderland) Volunteer Battalion the Durham Light Infantry: Surgeon-Lieutenant R. E. Beveridge, M.B., to be Surgeon-Captain. 2nd (Prince of Wales's) Volunteer Battalion the Devonshire Regiment: Surgeon-Lieutenant J. H. Gough resigns his commission. 3rd Volunteer Battalion the South Wales Borderers: James Abernethy, M.B., to be Surgeon-Lieutenant.

VOLUNTEER MEDICAL STAFF CORPS.

The Glasgow Companies: Surgeon-Lieutenant H. C. Reid, M.B., to be Surgeon-Captain.

THE MILITARY DISASTER IN TROCHI VALLEY.

The treacherous attack on an Indian force in Trochi Valley, on the Indo-Afghan frontier, is a rather serious affair. Apart from the loss of life which has to be deplored it must lead to a punitive expedition against the tribesmen, the mere cost of which is embarrassing to the Indian Government at the present time, when there are so many calls upon the Indian Treasury. That the attack was a preconcerted act of treachery there can be no doubt; and it was fortunate, under the circumstances, and seeing that it was quite unexpected, that the whole force was not massacred. As it was, the Indian troops had to make a fighting retreat for a distance of four miles towards Sherani Valley, hotly pursued and hardly pressed by the Pathan tribesmen. Surgeon-Captain Cassidy was one of the wounded—the wound is stated to be in the knee—but we are glad to say that he is reported to be doing well. The Trochi Valley is close to the Kuram route, through which the advance was made in the last Afghan war to avenge the massacre of the Cavagnari mission at Cabul. The inhabitants belong to the fanatical Waziri tribes, and the valley is an important position, as it forms a short cut to Guzni, in Central Afghanistan. It is not the first time within recent years that the tribesmen have attacked a British force in that neighbourhood.

ENTERIC FEVER IN INDIA.

The Anglo-Indian papers received by the last mail contain, we regret to say, intelligence corroborative of the truth of our remarks that the periods of maximum prevalence of enteric fever commonly corresponded with that of the heat in India, and that the seasons directly preceding and succeeding the rainy season, the monsoon, were those in which outbreaks or cases of enteric fever were wont to occur. We learn that there have been several fatal cases of this fever at Agra, Sialkote, and Rangoon. There have been between fifty and sixty cases, several of them fatal, in the York and Lancaster Regiment since their arrival at Agra. It will be remembered that this was the regiment shipwrecked in the *Warren Hastings* on its way to India, which exhibited such an admirable spirit of discipline on that occasion. The *Pioneer Mail* of the 26th ult. states that the cause is ascribed to the water, the supply of which is obtained from the water-works; but in that case it may be confidently expected that the prevalence of the disease will not have been limited to the York and Lancaster Regiment, but will have extended to other people obtaining their supply from the same source. There is frequently a diminished prevalence of the disease during the monsoon, with a subsequent rise; but we hope the worst of the outbreak is already over.

DEATHS IN THE SERVICES.

Ethelbert Henry Blake, M.D. Edin., A.M.D., Deputy-Inspector-General of Hospitals, at Bedford on the 6th inst., in his seventy-ninth year. He was appointed surgeon in 1841, surgeon-major in 1853, surgeon-lieutenant-colonel in 1861, and retired with the rank of Hon. Deputy Inspector-General in 1867. He served with the 98th Regiment in China (medal), was present at the storm and capture of Chin Kiang Foo, and was in the Eastern Campaign of 1854-55, including the battles of Alma and Inkerman, the seige of Sebastapol, and repulse of the sortie on Oct. 26th, 1854 (medal with three clasps, and Turkish medal).

Staff-Surgeon Henry Clerke, R.N., on the 25th ult., at Boulogne-sur-Mer, aged fifty-two years. He was appointed a surgeon in the Navy in July, 1868, staff-surgeon in December, 1879, and retired in September, 1881.

THE PLAGUE.

The great improvement which has of late taken place in regard to the prevalence of the epidemic in India continues, according to the latest reports from that country, and public confidence in regard to it is pretty well re-established. A report from Constantinople of the 13th inst. regarding the appearance of the disease in the Red Sea may, however, be of serious import if true. Bubonic plague is stated to have broken out at Djeddah on the Red Sea, six of the cases having proved fatal. The Turkish Government is taking active measures to arrest the outbreak.

Correspondence.

"Audi alteram partem."

"URIC ACID IN THE BLOOD."

To the Editors of THE LANCET.

SIRS,—It may be that I am doing Dr. D. F. Shearer an injustice in thinking that he is not practically acquainted with the Gowland Hopkins method for the estimation of uric acid; but it appears to me that he has ventured on the dangerous ground of criticising a process that he has never employed. The process that I described for the estimation of uric acid in the blood consisted of two parts—an extraction process and an estimation process. The former part of the process stops short of the washing of the uric acid, during which there is a loss of from one to two milligrammes of the acid by solution. As I was never able to extract any uric acid from normal blood there was none to estimate, and consequently there was none to wash. The murexide test was applied in every case in which I examined blood for uric acid. It is true that I did not refer to those negative experiments in the Goulstonian Lectures, but the time at my disposal for the delivery of the lectures necessitated the omission of mention of a large number of experiments. It would have been as well if Dr. Shearer had stated on what calculation he based his assumption that an average proportion of one part of uric acid in 1,000,000 of blood would be sufficient to furnish the uric acid found in the urine. The assumption is, I believe, incorrect. If the ratio of the urea elimination in the urine to the quantity of urea known to be present in the blood be taken as representing the ratio between the elimination of uric acid and its supposed amount in the blood, then human blood should contain from five to ten parts of uric acid in 1,000,000. The blood of birds would necessarily contain a much higher proportion than that, assuming that uric acid is present in the blood. Such quantities would readily be found if present.

I am, Sirs, yours very truly.

Weymouth-street, W., June 9th, 1897. ARTHUR P. LUFF.

THE LATE DR. LOCKHART ROBERTSON.

To the Editors of THE LANCET.

SIRS,—As a colleague of the late Dr. Lockhart Robertson (as chaplain of the Sussex Asylum, Haywards Heath, 1859-1867), I was interested in the obituary notice in THE LANCET of June 5th. May I be permitted to mention the share which he took in the formation of the "After-care" Association on behalf of poor friendless female convalescents "on leaving asylums for the insane"? As the result of a conversation between Dr. Robertson and myself a meeting was held through the influence of the former, and by kind permission of Dr. Bucknill at his house, 39, Wimpole-street, on June 5th, 1879. There were present Dr. and Mrs. Bucknill, Miss Cons, Dr. Lockhart Robertson, Dr. D. Hack Tuke, Mr. W. G. Marshall, Dr. Harrington Tuke, &c. A paper on the subject of "After-care" printed in the October number of the *Journal of Mental Science*, was read by the Rev. H. Hawkins. It was moved by Dr. Lockhart Robertson, and seconded by Dr. Hack Tuke, that "this meeting do form itself into an association." The names of Dr. S. Williams and Dr. Savage were, at Dr. Robertson's request, added. It was also moved by Dr. Robertson "that Dr. Bucknill be invited to take the office of president," subsequently held by the late Earl of Shaftesbury and the Earl of Meath. Later in the same year Dr. Robertson again attended and spoke at a meeting at the President's house, and in 1881 he was present and spoke at an anniversary gathering at the house of Dr. Andrew Clark, 16, Cavendish-square. Dr. Robertson's various engagements prevented his attendance at meetings in after years, but at the time of his death he was one of the vice-presidents of the "After-care" Association. These few lines from a former associate in work may serve to indicate the interest taken by his distinguished colleague in the institution of the society.

I am, Sirs, yours faithfully,

HENRY HAWKINS,

Hon. Sec. "After-care" Association; Chaplain of London County Asylum, Colney Hatch, 1867-97.

June 12th, 1897.

"A METHOD OF UNITING THE DIVIDED INTESTINE."

To the Editors of THE LANCET.

SIRS,—Under date May 22nd, 1897, I notice in THE LANCET a description by a London surgeon of a reputed new method of uniting a divided intestine. I desire to call attention through your journal to the fact that this operation was devised by me in 1891. It was published in 1892, a copy of which publication you can find in the library of the Society of Science, Letters, and Arts of London, England, which I forwarded at the request of the secretary of the society. I have demonstrated it from year to year to the students at the West Virginia University, performed it many times on living animals and the human cadaver, and it is now, and has been for some six weeks past, in the hands of the editor of the *New York Medical Journal* awaiting its turn for publication. I think the priority of the above-recorded facts should entitle this side with at least the first description of the operation without in any way detracting from the credit due to the originality of the excellent English surgeon.

I am, Sirs, yours faithfully,

J. W. HARTIGAN, M.D., F.R.M.S., &c.,

Professor of Biology in the West Virginia University.

Morgantown, West Virginia, June 4th, 1897.

*** We presume Dr. Hartigan refers to the Science and Art Department of the Committee of Council on Education,

South Kensington Museum. We do not know of any learned society with the exact title he mentions.—ED. L.

THE MIDWIVES REGISTRATION BILL.

To the Editors of THE LANCET.

SIRS,—Undoubtedly the suggestion of Sir J. Blundell Maple with regard to the Midwives Registration Bill is an excellent one, but would it not be more satisfactory to nurses, patients, and practitioners alike to allow any registered medical practitioner to be called in to inspect and to notify the case to the medical officer of health?

I am, Sirs, yours faithfully,

June 8th, 1897. HEBAMME.

"THE NEW LUNACY BILL."

To the Editors of THE LANCET.

SIRS,—I beg to draw your attention to a clause in the new Lunacy Bill which has been lately introduced by the Lord Chancellor in the House of Lords. The clause, No. 5, is this: "Whereas it is expedient to extend the disqualifications for signing medical certificates in support of a petition for a reception order, there shall be added at the end of Sub-section 1 of Section 32 of the principal Act the words, '(c) the person who makes the reception order,' and at the end of Sub-section 3 of the same section the words 'or any officer or servant in the employment of such committee, or in a licensed house under an order made on the application of or under a certificate signed by a licensee of any licensed house, or any person in the employment of any such licensee.'" By this it will follow that every licensee and everyone in such employment, which will include lay proprietors and ladies and visiting physicians, will be deprived of the ordinary privilege of choosing an asylum for any afflicted relative which every citizen now enjoys. I venture to think that this would be a monstrous iniquity. In addition, no licensee or anyone employed by a licensee may sign a certificate for any licensed house. You are probably aware, Sirs, that at the present time there is great difficulty in getting certificates signed by ordinary practitioners, and many totally refuse to do this. Public asylum officers are most of them debarred from private practice, and in London their number is extremely small. This clause will prevent almost all the experts in London from signing certificates for private patients; and, besides the inconvenience, I look upon the proposed enactment as an insult to the whole medical profession. No doubt it is aimed as a blow at private asylums. The effect will be the increase of lunatics kept in unlicensed houses—a practice which even now is greatly encouraged by the difficulty of getting a magistrate's order and certificates under the Act of 1890.

I am, Sirs, yours truly,

June 13th, 1897. Z.

THE BATTLE OF THE CLUBS.[1]

(FROM OUR SPECIAL COMMISSIONER.)

(*Continued from p. 1639.*)

COVENTRY (*continued*).

NEEDLESS to say that I have heard numerous and doleful stories about patients who have suffered from the mistakes and neglect that are the natural result of overwork at the Coventry Provident Dispensary. Thus a case of strangulated hernia was mentioned which had been left for four days without operative treatment. Another member of the dispensary was treated for rheumatism when he was suffering from a spinal abscess. Of course this patient had not been examined. A woman complained that she remained seventeen days in bed before she could get a medical man to visit her. But it is impossible to blame the dispensary staff. It is composed of medical men who stand high in the profession, only it is mathematically impossible that they should give the necessary time to their patients when, besides extensive private practice, they each have on an average 5000 or 6000 dispensary members on their books. Not only does overwork result in neglect and in mistakes, but it gives encouragement to, and opens out a good field for, the incursions of enterprising quacks. Bone-setters have a good opening, because such operations require more time than can be given for consultations that do not bring in more than two or three pence. If a dispensary patient goes to a quack, it is so much work off the medical man's hands without any reduction in his income. Dispensary medical officers have no cause to be resentful against the quacks who relieve them of some of their most troublesome cases; but all this tends to lower the whole tone of medical practice, and it is high time that energetic measures should be taken against this degradation of the profession.

The next important incident that occurred was the refusal of the medical journals to insert an advertisement of the Coventry Dispensary when a vacancy occurred on its medical staff. The institution was thus placed beyond the pale of honourable recognition by the most authorised organs of the profession. The members of the dispensary medical staff now sought to defend themselves, and their letters were published in the local and in the medical press. They urged that the dispensary was not a charity, but a provident institution founded for the benefit of the working classes. The dispensary, they said, was governed by a committee of twenty-four persons, twenty-two of whom were elected annually by the members from their own ranks. The two other committee men were members of the medical staff. Doubtless a few persons who had entered as workmen had now acquired some wealth, but the working-class character of the institution was fairly well maintained. Whatever abuse there might be, similar abuses existed in other clubs, and when the members of the profession met in 1892 to reform these abuses a great deal of good might have been achieved. In the opinion of the dispensary medical staff, the movement, however, degenerated into an attack upon the dispensary and the dispensary alone. The medical staff of this institution were most anxious to establish a wage limit; but the violence, the lack of courtesy, and the animus of the other medical men produced just the contrary effect, and the resolution that pecuniary position should be no bar to admission was adopted as a sort of reply to these attacks. The adoption of this defiant resolution was deeply regretted by the medical staff, and they promised to use all their influence so that it should be rescinded. They declared that they had "opposed the resolution to the last, and afterwards presented to the committee and entered in the minute book a solemn protest against the whole proceedings." Also in a letter drawn up in November, 1894, and signed by the five dispensary practitioners, the following explanation is given: "For the consideration of the reform movement only two meetings of the profession were held to which we were invited. Three of our number attended the first, while the whole staff attended the second, and again expressed approval. When, however, we were asked to join in this bitter and unwise attack upon our institution we refused, but with a most important qualification, as will be seen from the following quotation from our letter with regard to it, dated Jan. 23rd, 1893. 'While sympathising to the fullest extent with the object in view (medical reform), we feel sure that as a medical committee officially connected with the institution we can do far more to remedy and prevent abuses than by joining a self-constituted committee having no connexion with or power over the management of its affairs.' Not only did we sympathise, but we brought the matter so forcibly before our committee that a special committee was appointed to inquire into the questions at issue, and important modifications were drawn up and agreed to that would have done much to check the abuses complained of, and we also promised that the objectionable rule prohibiting us from meeting medical men not on our own staff in consultation upon dispensary cases should be disregarded (we had no power to abolish it) and that when asked we should meet them as in private practice."

Thus it will be seen the dispensary medical staff took up the argument that reform must come from within, and that pressure from without had produced a reaction against such reform. To my mind, this argument shows that the true spirit which should govern all such efforts had not dawned in the minds of those concerned. If the negotiations for reform were limited to the members of the dispensary on the one side and the dispensary medical staff on the other, this would simply result in haggling and bargaining between

[1] A reprint of the previous articles on the above subject has been published in book form entitled "The Battle of the Clubs," and can be obtained from THE LANCET Office, price 1s.

persons fighting for their own individual interests. A greater and a nobler cause is at issue. First and foremost, the public has to be protected from the evils, the danger to health, which the abuse of such institutions as this provident dispensary must occasion. Secondly, the profession as a whole must be rescued from the degrading effect of the wholesale and cheap medical relief which dispensaries organise. The strength of the agitation depends on the faithfulness of its adherence to the general interests first of the public and secondly of the profession; and the dispensary medical men would lose all their moral power if they appeared to be pleading for their own interests instead of defending those of the public and the profession at large. Naturally when it was found that they were ready to sever themselves from the other medical men of the town their influence was lost, and the members of the dispensary, instead of establishing a wage limit, proceeded solemnly to declare that the possession of wealth should not be a bar to membership.

It is curious that in all this controversy the interest of the public has not been very clearly and emphatically stated. Mr. T. M Daffern, who has taken a leading position in resisting the demands of the medical men, argued that the dispensary is not a charity, because it pays, and pays well, the medical men in its service. Writing to the *Coventry Herald*, March 1st, 1895, Mr. Daffern says: "May I remind your readers of the state of affairs early in 1893, prior to the passing of the resolution. Of the subscriptions to the dispensary the ordinary members paid £3114, against £18 by the honorary members. For this £18 the honorary members received an equivalent in tickets admitting sick persons as members. Five of the medical staff received an average of £349 13*s.* 8*d.* each from the institution. The sixth, only appointed during the year, received £55 19*s.* 6*d.* They were also allowed to take private practice. It will thus be seen that the ordinary members were themselves properly paying for the benefits they were receiving." This statement, on the contrary, shows, and very clearly, that the medical staff is not properly paid. For 25,000 members, not six or five, but at least twelve medical officers should be employed, and this would reduce the above remuneration to one half the sum for each. The public should know that one medical man cannot possibly attend, thoroughly examine, and give good, thoughtful, and lengthy consultations to the sick out of a population of about 5000 persons, particularly if he has also an extensive private practice. There is no avoiding this dilemma. Such wholesale contract work can only pay if it is "scamped." At this rate of remuneration a proper consultation must be a work of charity; and I put it to the Coventry Provident Dispensary patients, Do they, on an average, obtain the professional ten minutes or a quarter of an hour? If they do they are in receipt of charity; if they do not, then at times public health must be endangered and a public injury is brought about. The honour of the profession is compromised and medical practice is degraded. It is no use saying that each member of the medical staff receives more than £300 a year, the question is, What do they receive per consultation? If they receive less than the minimum fee per consultation, their work is a work of charity when it is efficiently accomplished. If Mr. Daffern had shown that the average of £349 paid in the year to each of the medical staff represented a fee of 2*s.*, or even of only 1*s.* 6*d.* for each consultation given it would be satisfactory. This would prove that the medical men had given only an average of ten or twelve consultations per day, and could therefore well afford to devote about fifteen minutes to each patient. But, in answer to Mr. Daffern's letter, the *Coventry Herald* of March 8th, 1895, published the following:—

"SIR,—My attention has been drawn to a letter in your paper on the Dispensary question. Mr. Daffern has been somewhat unfortunate in the time chosen for his communication. Last week it was published that 3000 prescriptions had been made up at the Dispensary during four days. The thought strikes one, who made up those prescriptions, and again, who wrote them? Unless prescribing can be done by machinery it can hardly be said with Mr. Daffern that 'the Dispensary system is not a sweating one.' Let us make a calculation. As most influenza patients must be seen at home, it is reasonable to allow ten minutes for each prescription; we can hardly imagine that less would suffice. It follows that the six Dispensary doctors must have been hard at work for over twenty hours each day, with an interval of four hours for private practice, sleep and refreshment! In the interests of those for whom the Dispensary was intended, I ask, is such a state of things desirable?" The letter was signed "F.R.C.S."

That such practice is degrading is further shown by the testimony and action of Mr. J. L. Callaghan. Mr. T. S. Allan, one of the dispensary medical officers, on retiring, sold his practice to Mr. Callaghan. The latter did Mr. Allan's work at the dispensary as locum tenens for six weeks, as he had been told there was nothing unprofessional in this work, and hoped ultimately to succeed Mr. Allan on the dispensary medical staff. But his few weeks' experience at the dispensary soon altered his views. The Coventry papers, the *Herald* of July 17th, and the *Standard* and the *Reporter* of July 18th, 1896, inserted the following copy of a letter which had been sent to them for publication, and had been addressed to the chairman of the Coventry Provident Dispensary. It ran as follows:

"13, Queen's-road, Coventry, July 14th, 1896.

"SIR,—As I have led the members of your committee to understand that I would be a candidate for the vacancy on the medical staff caused by the resignation of Dr. Allan, to whose practice I have succeeded, I think it right to let you know my reasons for declining to allow my name to appear among the list of candidates.

"During the six or seven weeks in which I acted as deputy medical officer to the dispensary I discovered the working of the institution to be of such a nature that I fail to understand how any medical man with any respect either for himself or his profession could allow his name to be connected with it, and therefore I have decided to withdraw my candidature.

"I may be at a pecuniary disadvantage in not obtaining this appointment, but as a stranger coming to Coventry, and wishing to uphold the honourable traditions of a learned profession, I cannot see my way to accept an appointment in any institution which is not approved of by the majority of medical men.

"As surgeon to the Public Medical Service, I hope to be able to devote more time to each patient than I could if attached to your institution, and at the same time conduct my practice on lines not distasteful to the majority of the members of my profession.

"Yours faithfully,

"J. LESLIE CALLAGHAN."

That the staff of the Public Medical Service can devote more time to their patients naturally results from the rules of that institution. There is to be a limit for the number of members to be inscribed on any medical man's list. This number has not yet been absolutely fixed by the adoption of a resolution, but it is generally understood that no medical officer of the Public Medical Service must have more than 2000 members on his list. Then, as the service is not a monopoly, but open to all the medical men of the town, there is no danger of some having too much work and others too little. To the public this is the best of guarantees. The interest of the public is to see that no medical man has too much underpaid work. All medical men are willing to do a certain amount of work either gratuitously or for very inadequate pay, but this charitable disposition must not be imposed upon if the temptation to "scamp" the work is to be avoided. The Public Medical Service have now from 5000 to 6000 members on their books, and the success is such that no levies have been necessary. Not only have the medical men not been called upon to pay up the remaining £3 for which they rendered themselves liable, but the £2 they gave on joining have been refunded, and there is a balance in the bank of from £25 to £30. During the first year the medical staff received 2*s.* per member, now they receive 2*s.* 6*d.* per member, and the 10*d.* which remains after the druggists have been paid not only covers the cost of collecting but all the incidental expenses. Thus the organisation of medical aid by the medical men themselves without any intermediaries has proved a financial success.

In dealing with other abuses besides those connected with the provident dispensary the Public Medical Service has also met with a large measure of success. When this association was first formed, it was understood that all private practitioners' clubs should be given up, and the members invited to join the Public Medical Service. Six medical men who were in the service of the Star Benefit Society, the National Medical Aid Association, and other insurance and speculative concerns were induced to relinquish their appointments and bring over as many of their members as possible to the Public Medical Service. To meet this strike the insurance companies were only able to import one medical man from the outside, who still remains in Coventry. Six practitioners belong to the Provident Dispensary, one has a large private club of his own which counts some 2000 members; this he would not give up. Another, on the ground of old age, did not feel disposed to take an active part in the movement, but is not in opposition; he remains neutral. Altogether eleven medical men have joined the Public Medical Service, though only nine are disposed to attend the members. Thus it will be seen that, setting aside the dispensary medical officers, great unanimity prevails among the remaining members of the profession at Coventry, and even the dispensary medical officers are more in agreement with their fellow practitioners than appears on the surface.

Calling upon some of the medical officers of the dispensary,

I found that they very frankly recognised the existence of abuses, but had concluded that if they resigned it would only mean the calling in of outsiders to take their places. They had been recently assured that in Birmingham alone there were some fifteen medical men all ready to come to Coventry if invited by the dispensary. This assertion is, however, open to doubt. When, many years ago, the late Dr. Fenton was appointed there were no less than twenty-seven applicants for the post he obtained. About three years ago, to fill up another vacancy, there were not more than four applications, while for yet another vacancy, occurring less than a year ago, there were only three candidates. Of these three, only one was a local practitioner, so that his election was practically uncontested. It seems probable that none but inferior men will accept service in an institution which the organs of the profession refuse to recognise. The strength of the Coventry Dispensary rests on the fact that so far the members of its staff are men of undisputed high standing. The question arises whether the people who drive in their own carriages, who live in villas and yet are members of the dispensary, will be satisfied with medical men of inferior standing. Perhaps the medical staff of the dispensary exaggerate the danger of outsiders stepping in to take their place. Besides, if they were to leave the dispensary and join the Public Medical Service, they would bring over a considerable number of the dispensary members with them. As they would receive for each member thus brought over a much larger sum than they obtain from them as members of the dispensary, they might not perhaps experience any very great loss; also some of the Public Medical Service practitioners expressed to me their willingness to hand over some of their own patients to the dispensary medical men so as to cover any such loss if the staff of the dispensary would agree to join them. As for any personal animosities, they would be at once forgotten if the dispensary staff would only step out and stand shoulder to shoulder in union with the majority of the Coventry practitioners. But still the dispensary doctors adhere to their former policy of effecting reforms from within. They are now again negotiating with the dispensary committee for, I believe, the imposition of a wage limit and a distinct definition of the class of persons to be admitted as members of the dispensary. It was, however, explained to me that they did not wish to publish details about negotiations that are still pending. Also their case has been submitted to the arbitration of the Birmingham Branch of the British Medical Association, and they do not care to discuss the matter publicly till they know the result. One of the dispensary medical officers, however, pointed out to me that they had not been idle and had obtained some improvements. It has already been explained that when the medical men in the service of the Star Benefit Society left that insurance company so as to join the Public Medical Service, the dispensary took in all the members of the Star Benefit Society, thus helping a financial company to dominate the medical profession. The dispensary has now, however, realised the unfairness of its action, and about a year ago refused to renew its contract with the Star Benefit Society. This reform—one might almost say this act of repentance—is cordially approved by the members of the Public Medical Service, and may be considered as an important step towards a reconciliation between the two parties.

Still there is the great financial question that bars the way. As a dispensary medical officer remarked to me, "We have families and children. The dispensary, roughly speaking, brings us in £1 a day. We cannot lightly give this up. If in so doing we were to succeed in bringing about the desired and desirable reforms, we know full well that we should be loudly applauded by all the profession. But if we fail we also know that we should not receive a particle of help from anyone, and we should have to endure poverty and perhaps reproaches for engaging in a struggle without having ensured the means of success." In his opinion the matter ought to be taken up in high quarters and before they were called upon to resign, some guarantee ought to be given that others will not step in and take up their position. The main source of income cannot be given up merely on a question of principle. For a material sacrifice of so crushing a character, some sort of material guarantee and compensation must be forthcoming. As matters now stand the dispensary does not increase the number of medical men on its staff unless their average income exceeds £350 a year. Considering the cheap terms for the admittance of children, that clubs are accepted at 3*s.* per adult member, and that there are fifteen clubs attached to the dispensary, it will be seen that an enormous number of members must be enrolled before the income of the six dispensary medical officers exceeds the average of £350 each. A census taken a few weeks ago shows that the population of Coventry now amounts to 60,990 persons; yet (and including the boycotted practitioner who is in the service of the insurance company) there are only twenty-one medical men. But for the dispensary and the clubs there would be room for more, particularly as the working classes earn good wages and the necessities of life are very cheap. But what is to be done when, for instance, a manufacturer who pays £50 a week in wages belongs to the dispensary and pays only 4*s.* 4*d.* a year for his medical attendance; when a number of prosperous tradesmen belong to the same institution, together with many of the workmen who are well able to pay small fees, and could afford to be independent of charity for all but prolonged illnesses or expensive surgical operations. But the people of Coventry have lost the habit of paying medical fees, and the Public Medical Service is at a great disadvantage, because when they seek to impose their wage-limit, the persons affected have only to apply to the dispensary, where they are at once admitted, and this at a lower rate of subscription. Then the high-class character of the medical men on the dispensary staff renders it still more difficult for the Public Medical Service to compete against this institution. As a rule, institutions that are condemned by the medical profession are not served by men of such high reputation, and enough has now been said to show that even without this factor there is good reason for condemning the Coventry Provident Dispensary.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

Health of Liverpool.

THE death-rate of Liverpool is nearly always an uncertain quantity, being much affected by outside influences. At the last meeting of the health committee Dr. Hope accounted for the increased death-rate by the prevalence of measles, in consequence of which several schools have been closed; also by an influx of persons from other towns dying in the city hospitals. Eight of such cases had come from Bootle, whilst others had been brought to the hospitals from Conway, Garston, Crosby, and Barrow, accounting altogether for eighteen deaths, which, properly speaking, ought not to be credited to Liverpool. An unusually large number of infants had died from suffocation; no less than nine inquests where such a verdict was returned having been held last week on children under twelve months old. At the same time the death-rate cannot be considered exceptionally high at 23·3 per 1000 of the population. Dr. Hope has been deputed to attend the International Medical Congress to be held at Moscow in August next. The health committee have also authorised Alderman J. Houlding to accompany Dr. Hope to Moscow.

Birkenhead and the Queen's Jubilee.

The Mayor of Birkenhead has opened a fund for carrying out a commemoration scheme having for its objects the extension of the Birkenhead Borough Hospital by the addition and furnishing of a new wing; the establishment of a home for trained nurses; and the providing of free nursing amongst the sick poor of all denominations in their own homes. It is also intended to provide nursing on a graduated scale for those who are able to make small payments, according to their circumstances. A sum of £6000 will be required to carry out the above objects, of which £3775 9*s.* 6*d.* have already been subscribed or promised.

The Cost of the Public Health Department of Liverpool.

The accounts of the city treasurer for the year 1896 have just been issued. The statement includes the expenses of working the public health department, also those of the department of the inspector of nuisances. The sum of £4487 18*s.* 10*d.* was expended on the medical officer of health's department, after allowing for deductions, such as fines, Exchequer contributions, &c. In these accounts are included notification fees for infectious diseases, which amounted to £651 12*s.* 9*d.*; also fees to registrars for death returns, amounting to £181 19*s.* 1*d.* The department of the inspector of nuisances costs the public £5983 7*s.* 8*d.*, allowing

for deductions of a similar kind to those of the medical officer's department. The port sanitary payments, which include the maintenance of infectious cases in the various city hospitals, are set down at £4372 17*s.* 11*d.* The cost for the year of demolition of insanitary property amounted to £34,950 12*s.* 9*d.* This amount does not include the cost of property purchased, which is stated to have been £223,626 13*s.* 6*d.*, with charges thereon amounting to £37,295 0*s.* 4*d.*

Liverpool and the Montreal Meeting of the British Medical Association.

The medical profession of Liverpool are to be congratulated on the number of official positions accorded to them at the meeting of the British Medical Association to be held in Montreal in August. Mr. Mitchell Banks, senior surgeon to the Royal Infirmary, is to deliver the address in Surgery; whilst Mr. T. H. Bickerton, Professor Boyce, of University College, Liverpool, and Dr. W. Permewan have been respectively appointed secretaries of the ophthalmological, the bacteriological and pathological, and the laryngological sections.

Liverpool Royal Infirmary.

Mr. George Melly has presented the Royal Infirmary with a complete apparatus for the application of the Roentgen rays.

June 15th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Honorary Degrees of the University of Dublin.

A MEETING of the Senate of Dublin University was held on June 14th for the purpose of considering an address to the Queen, and in reference to graces for conferring honorary degrees by the board. The graces adopted were duly confirmed. They included the honorary degree of Doctor of Science conferred on our recent distinguished visitor, H. Wilhelm His, Professor of Anatomy, Leipzig.

The Visit of the Anatomical Society of Great Britain and Ireland.

The business portion of the proceedings of this society concluded by the address to the Fellows and Members of the Royal Academy of Medicine in Ireland by Professor His of Leipzig on the Development of the Brain and Nerves. On the following morning a party consisting of over twenty members, conducted by Dr. William Haughton, the honorary secretary of the Dublin branch of the society, started by an early train on an excursion to Killarney. The party included Herr Waldeyer, the Professor of Anatomy from Berlin; Professor Lebourg, of Ghent; Professor Thaine, of London; Professor Disse, of Marbourg; Professor Spalteholtz, of Leipsic; and Professor Young, of Owens College, Manchester.

The Irish Medical Association.

The annual meeting of this association took place recently in Dublin, under the chairmanship of Dr. T. H. Moorhead, the newly-elected president. A resolution was passed unanimously, instructing the council "to take such proceedings as may seem to them advisable to procure an amendment of the existing Poor-law system, having particular regard to superannuation, annual leave of absence to medical officers, workhouse infirmaries, and the abuses so prevalent in the issue of medical relief tickets."

During a subsequent discussion it was stated by the ex-president, Mr. Meldon, that the failure of the Irish Superannuation Bill of last year was caused by the fact that its passage was blocked by the action of three or four Irish members of Parliament who were alleged to have been influenced by some country Poor-law guardians. After the meeting, the members of the Association dined at the Royal College of Surgeons, where they entertained the Right Hon. Charles Hemphill, Q.C., M.P., Lord Monteagle, and many other guests. Resolutions were proposed by the above, by the President of the Royal College of Physicians of Ireland and the President of the Royal College of Surgeons in Ireland and by the President of the Association.

The Coroner for Dublin.

The salary of the Coroner for the City of Dublin has recently been under consideration and the finance committee of the corporation, have recommended that it be increased from £500 to £600 per annum. It was stated that the average number of inquests held in Dublin during each year is 250. Mr. Kenny, the coroner, is a medical man.

Jervis-street Hospital, Dublin.

The post of gynæcologist to this hospital has recently been filled by the appointment of Mr. T. G. Stevens, formerly assistant master at the Coombe Lying-in Hospital, Dublin.

Poor-law Administration.

The report of the Local Government Board upon the recent inquiry into the affairs of the Glenties Union (co. Donegal) was read at a meeting of the board of guardians held on June 14th. The master is censured and called on to resign, and he has done so; further, the report goes on to say: "From the evidence adduced on the present occasion, as well as at former inquiries, it appears that the management of the affairs of the Glenties Union for some time past has reflected little credit on the guardians. The business of this union appears, owing to the apathy of the rest of the members, to be left practically in the hands of a few guardians, whose administration leaves them open to the strongest suspicion of using their powers to advance their own personal interests. The Local Government Board have retained the minutes of the evidence taken in connexion with this inquiry in order to determine whether a prosecution should be instituted against the guardians concerned in the several discreditable transactions to which attention has been called." A special meeting of the board of guardians has been summoned by direction of the Local Government Board for June 26th to consider this report.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Bicycle from a Medical Point of View.

A LONG discussion has been going on at the Hospital Medical Society as to the benefit or harm to be derived from riding the bicycle, and the debate was all the more interesting from the fact that most of the members taking part in it themselves had experience of the machine in question. M. Petit reported a series of accidents, and cited five recent cases of death occurring in persons either actually riding or who had just left off. He concluded that persons suffering from cardiac affections ought either to abstain from bicycling altogether or at any rate only do so with the most extreme moderation. Phthisical people should for the most part abstain altogether; but, on the other hand, those predisposed to tubercle have in many instances derived great benefit, as have still more those suffering from certain nervous affections, neurasthenia, chlorosis, and constipation. Finally, M. Petit reminded the meeting that various affections of the joints and of the genito-urinary organs in both sexes, incompletely or only recently cured, had been revived or aggravated by the bicycle. M. Hallopeau, replying to M. Petit, said that the bicycle, which was not a physiological method of progression, offered, like all forms of athletics, both advantages and disadvantages. These latter were specially marked in cardiac subjects, in whom cardiac failure supervened. In certain subjects, even when free from cardiac disease, riding provoked painful sensations connected with the heart. He considered it prudent to avoid riding against head winds or up steep hills, and by taking this precaution many grave accidents would be avoided. Some people experienced numbness in the great toes during a prolonged ride, a phenomenon which M. Hallopeau attributed to the pressure of the saddle on the sciatic nerves. M. Rendu had seen symptoms of angina pectoris supervene after a long bicyle ride in a medical man who had never before shown any signs of cardiac affection, and considered that no person over forty years of age should take this form of exercise save in great moderation, so as to avoid a rise in blood pressure and cardiac fatigue. M. Legendre did not believe that the use of a bicycle could create a pathological condition; but undoubtedly it brought out certain maladies which had formerly lain latent; hence the necessity for examining young people before permitting them to commence this form of exercise. He had recently seen several cases of mitral regurgitation appearing in young people who before taking to bicycling had presented no sign of such complaint. Difficulty in nasal respiration owing to a deviated septum was also a cause of cardiac arrhythmia

and became markedly so in cyclists owing to their aggravated respiratory efforts. On the other hand, women with certain forms of menorrhagia derived much benefit from the bicycle. M. Ferrand stated that the effort of bicycling is in some sense unconscious, and, to use the language of M. Texier, produces a kind of automatism which prevents the rider from being conscious of over-riding and its dangers. M. Debove knew a medical man subject to attacks of cardiac intermittence which came on either during rest or work, and especially before sleep. Exercise had no effect with regard to them; he could go upstairs or ride a bicycle without bringing them on. He suffered from migraine, but his digestion was good and he was not gouty. M. Debove brought forward this case as showing that cardiac intermittence can occur independently of any fatigue, and that the evils due to bicycling are exaggerated by attributing to the practice results for which it cannot be blamed. M. Faisans considered that it was unfair to charge the bicycle with all the accidents that occurred during riding, as a certain number of these sudden deaths would equally have occurred from any form of exercise. M. Debove considered that the result of the discussion showed that excess in any form was harmful, and that as regarded the bicycle over-riding alone was dangerous. Let unsound persons avoid it altogether and the healthy use it in moderation, and all accidents would be avoided.

Koch's Tuberculin and the Academy of Medicine.

According to French law the sale of serums is only authorised after the Academy of Medicine, by means of a committee, has given its approval to samples and inspected the laboratories where they are prepared. This law was passed to prevent all sorts of serums being put forward by druggists for the sole purpose of advertisement and without any guarantee of asepsis or strength. Very few laboratories obtain the necessary certificate. Koch's tuberculin, to have the right of entry in France for sale, has had to undergo the judgment of the Academy based upon the report of M. Nocard, the assistant director of the Pasteur Institute. The report commences by saying that any French product produced under circumstances precluding the Academy from any surveillance as regards the conditions of its manufacture would certainly be refused. The sample sent in, it continues, amounted to 1 c.c. enough for one experiment only as to activity, and the liquid was turbid and full of bacteria and yeasts. The bacteria were very possibly not pathogenic; but their presence was not reassuring, for it would appear to show that the liquid was not prepared under aseptic conditions, and even if the organisms did no harm to the patient they would probably weaken the power of the serum. The Academy, fearing that if they refused the authorisation altogether their action would be attributed to national jealousy, have authorised the introduction of the lymph provisionally, despite the report of M. Nocard. Many of the papers have published articles expressing regret at this decision.

Scandal at a Lying-in Hospital.

The Municipal Council gave a whole sitting to the consideration of the case of a parturient woman who died from not having been admitted in time to the hospital where she applied for relief, and the meeting took advantage of the occasion to deliver a violent attack upon the organisation of hospitals in general. It appeared that the woman had just been delivered of twins, but that only one placenta had come away. She applied in the middle of the night at the hospital, where the midwife on duty would have admitted her except for the fact that there was no vacant bed. She applied to the head midwife and the director of the hospital, who declared that in the absence of a bed the woman could not be admitted. They telephoned, however, to two or three other hospitals, and finally found a vacant bed for her at the Charity Hospital, to which the woman was taken as soon as possible and there delivered. Five hours afterwards she died. The chief of the Assistance Publique reprimanded the director of the hospital and the head midwife and suspended the midwife on duty. The Municipal Council demanded an inquiry so as to make it appear whether or no the responsibility rested with the director only, and regretted that an inferior, who was probably not responsible, had been punished with a view to sparing the chief. The discussion was very heated despite the fact that the Director-General reported that the result of the post-mortem examination showed that the woman had died from causes quite unconnected with the delay in her delivery or in her admission to a hospital.

The Provident Societies.

In the course of a discussion which recently took place in the Chamber on the new law which has just been introduced with regard to provident societies great leniency was shown to these societies, which do grievous harm to medical men by reason of their miserably low fees. It was demanded on behalf of the societies that they should have the right to gratuitous legal assistance in case they had a law-suit, but the legal profession protested vehemently against this, saying that bodies which had a capital of 40,000,000 francs and a membership of 500,000 in France should not in reason be admitted to favours reserved for the indigent alone. The Chamber, where there are many lawyers, saw the justice of this argument and refused the application, but not one of the numerous medical deputies said a word with regard to the shameful tariff which these societies impose on medical men. These members were more concerned for the pockets of their constituents than for the interests of their brethren. On the motion of a deputy, not a medical man, it was decided to insist that there should be two members of the Academy of Medicine on the superior council of the provident societies, and it is possible that these two gentlemen may, if they will, play an important *rôle* for the benefit of their profession.

June 14th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Congress of Internal Medicine.

THE fifteenth annual meeting of the Congress of Internal Medicine, the proceedings of which will be reported in a forthcoming number of THE LANCET, was held this year in Berlin. This Congress dates from the year 1881, up to which time the annual congresses of the Association of German Naturalists and Medical Men offered the only opportunity for the holding of discussions on clinical medicine; the surgeons, however, had their first special congress as early as 1871. The original organising committee, composed of Professor von Leyden, Professor Gerhardt, Professor Kussmaul, and Professor Seitz, proposed to make Wiesbaden the seat of the congress, avoiding a university town in order that no individual university might have a preponderating influence on the proceedings. All the meetings were accordingly held in Wiesbaden until 1889, except that in 1884 the congress took place in Berlin as a token of respect to its honorary president, the late Professor von Frerichs. In 1889 it was decided to meet only every second year in Wiesbaden, and in the intervening years to meet alternately in Munich, Leipzig, Berlin, and Vienna, by which arrangement it was hoped that medical men in distant parts of the German Empire and in Austria who might be unable to make a long journey to Wiesbaden would have an opportunity of taking part in the proceedings. This year's Congress was opened on June 9th in the great hall of the Architects House. Professor von Leyden, the president, having been called away the day before to Bukarest to attend the Crown Prince of Roumania, the chair was taken by Professor Moritz Schmidt, of Frankfurt, and the presidential address which Professor von Leyden had prepared was read by the acting vice-president. Internal medicine, it was remarked in the address, has entered on a stage of revolution, and therapeutics are now in favour, the former pessimism and disbelief being, fortunately, things of the past. Physicians no longer accept any dogmatic system and no longer try to cure the illness, but endeavour to cure the patient regarded as an individual. Medicine must not only be an exact science, but must also be an art—the art of curing. Two new classes of therapeutical agents have become available during recent years—namely, the antitoxins and extracts prepared from various parts of the animal organism. Behring's diphtheria antitoxin has been an undoubted success; as to the other antitoxins, such as those of tetanus and erysipelas, no definite judgment can be pronounced. The thyreoiodin of the late Professor Baumann was an important step in the use of animal extracts. Great improvements have been made in dietetic treatment, as well as in the mechanical and hydro-therapeutic divisions of the subject. The individual practitioner is no longer able to undertake

all the multiplied ramifications of therapeutics, and the subdivision of medicine into a number of special branches is inevitable, though it is no doubt from some points of view to be regretted. The training of the medical student has also become more difficult owing to the enormous mass of subjects which he is expected to know and which increases from year to year. Moreover, in the midst of this accumulation of details the fact must not be lost sight of that the principal aim of medical education ought to be the cultivation of the faculty of observing rightly. After the inaugural discourse the usual addresses of welcome were delivered by the representatives of the Government, the city, and the Berlin medical corporations respectively. Professor Virchow, speaking as President of the Berlin Medical Society, made the unexpected remark that there was some degree of likeness between the new antitoxin theory and the old humoral pathology. He was of opinion that the utility of the antitoxins was satisfactorily proved, but that from a theoretical point of view their action was still as obscure as the action of Jenner's vaccine. On the conclusion of these ceremonial proceedings the practical business of the Congress commenced.

The Antitoxin Control Office.

The Royal Antitoxin Control Office, over which Professor Ehrlich presides, will soon be removed from Berlin to Frankfurt. The reason alleged by the Government for this decision is that the principal antitoxin factory, the Hoechster Farbwerke, being situated in a suburb of Frankfurt, the work of the Control Office was much interfered with by the distance between that city and Berlin. But notwithstanding this distance the State control of the Hoechst factory has hitherto been so effective that its antitoxin has been declared by competent bacteriologists to be the best that is made.[1] Other reasons must, therefore, have induced the Government to come to this decision, and, in fact, the motives were of a merely financial nature, for the Government, departing from its former policy of open-handedness in this matter, has recently been but little inclined to spend money for scientific and especially for medical purposes, and the town council of Frankfurt having offered to provide both a large sum for the immediate requirements of the new office, and also an annual subsidy for its support, the Government at once accepted this proposal. The city of Berlin, which has rightly declined to spend the money of the city for institutions which it should be the duty of the State to support, will therefore lose the Control Office, and the departure of Professor Ehrlich will be much regretted by the medical profession here. Although Professor Ehrlich has never been an academical teacher in the strict sense of the word as far as the bulk of students are concerned, he has nevertheless exercised a great influence on a select number of students and graduates who worked under him and with him in his laboratory, where so many valuable researches have been conducted. His chair will be taken by Professor Brieger, the head of the clinical department of the Institution for Infectious Diseases.

June 14th.

Obituary.

KARL REMIGIUS FRESENIUS.

THE death is announced of Professor Karl Remigius Fresenius at Wiesbaden from an apoplectic attack at seventy-nine years of age. Fresenius was the director of the chemical laboratories at Wiesbaden, and his name will ever be remembered in connexion with his system of chemical analysis. It may be said, indeed, without fear of contradiction that Fresenius was the founder of analytical chemistry. His work in this direction is admittedly of a purely classical type. His various contributions have a distinct bearing upon medicine, since Fresenius was the author of, as he was the great authority on, the analyses of almost all the baths and springs in Europe used in medical treatment. His chief publication, "Chemical Analysis, Qualitative and Quantitative," was translated into English by Mr. A. Lloyd Bullock many years ago. The book has since reached a tenth edition and is even now the standard work of reference on systematic inorganic analysis. Fresenius was a busy man, a close and diligent worker, and a most skilful operator at the chemical bench. Curiously enough, he had at no time contributed any research, but his analytical results always gave evidence of the most painstaking work and of attention to those rarer saline constituents which, though occurring in small quantity, possessed nevertheless some importance.

[1] Vide the Report of THE LANCET Special Commission on the Relative Strengths of Diphtheria Antitoxic Serums, July 18th, 1896, p. 182.

CHARLES HOLDRICH FISHER, M.D. GLASG., M.R.C.S. ENG., L.S.A.

THIS well-known Kentish practitioner died at his residence at Sittingbourne on May 29th from degeneration of the heart at the comparatively early age of sixty-two years. He always said he should die in "harness," and this was so, for he saw his patients until within three weeks of his death. Dr. Fisher was educated at Glasgow University, where he was a distinguished student and made many lasting friends. He then settled at Sittingbourne, Kent, and became a partner of the late Mr. Ray. He was an especially energetic, active, and tactful practitioner, besides being a most genial and amusing companion and one who always engaged the attention of his hearers. He seldom took a holiday, hunting being his only recreation, and his merry laugh and cheery face were well known in the hunting field. He practised in Sittingbourne for forty years, holding parochial, and, in fact, nearly all the appointments, and he has left behind a large circle of sorrowing friends, especially amongst the poor, by whom he was so well beloved.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men have been announced:—Dr. Nocquart, Professor of Anatomy in the University of Brussels, in consequence of a dissection wound, at the age of forty-two years.—Dr. Auguste Mollien, Professor of Clinical Medicine in the Amiens Medical School.—Dr. Creus, of Manso, Professor of Clinical Surgery in the Central University, Madrid.

Medical News.

THE RECENT NIGER SOUDAN CAMPAIGN.—Mr. E. Craster, P.M.O. Niger Territories, and Mr. Stanton, M.R.C.S. Eng., have been mentioned in despatches.

DIPHTHERIA IN LONDON.—The amount of diphtheria in London in the four-weekly period ended on May 22nd does not compare so favourably with the preceding period as did that with earlier like periods in respect of the metropolis as a whole. The number (730) of notified cases in the four weeks ended on April 24th increased to 777 in the succeeding four weeks, the averages per week being respectively 182 and 194. But whilst in April two districts had upwards of fifty notifications each, there was only one such sanitary area in May. All districts save one were invaded in April, and all save two in May. The registered deaths from the disease were 134 in April, and averaged 33 weekly, the per case mortality rate having been 18·4 per cent. In May the deaths registered were 142, and averaged 35 weekly, the per case mortality having been 18·3 per cent. In the corresponding May period of 1896 the notifications amounted to 890 and the weekly average to 222, the deaths to 161 and the weekly average to 40, and the per case mortality rate to 18·1 per cent. The fatality rate was therefore closely allied on both occasions, but the amount of disease and the number of deaths have fallen in the current year as compared with 1896. In the three completed weeks that have elapsed since May 22nd, the registered deaths from diphtheria in London have been successively 36, 33, and, last week, 39. In the week ended June 5th the 33 deaths corresponded with the corrected decennial average for the twenty-second week of the period 1887–96, three of the deaths being of infants and one of a person over twenty years. Six deaths belonged to Kensington, and three respectively to Islington, Poplar, and Wandsworth sanitary areas. Last week the thirty-nine registered deaths in the metropolis were seven in excess of the corrected decennial average for the particular week. Seven deaths belonged to Shoreditch, four to St. George's-in-the East, and three each to Poplar and Greenwich sanitary areas. All thirty-nine deaths were of young persons aged under twenty years, and five were of infants. In the fortnight ended with last Saturday there were eighteen deaths registered from diphtheria in the outer ring of London, eight occurring in the West Ham registration district.

MEDICAL MAGISTRATES.—Mr. Thomas E. Abbott, L.S.A. Lond., of Gormanston, Tasmania, and Mr. Herbert W. Brownrigg, L.K.Q.C.P., L.R.C.S. Irel., of Broome, Western Australia, have been appointed Justices of the Peace for the district of Macquarie, Tasmania, and for the colony of Western Australia respectively.—Mr. John H. Thomas, L.R.C.P. Edin., M.R.C.S. Eng., has been placed on the Commission of the Peace for Barrow-in-Furness.

VICTORIA UNIVERSITY.—The following have been adjudged worthy of the degree of M.D.:—J. M. Johnson, M.B.: Thesis, Disinfection by means of the Vapours of some of the Members of the Phenol Series; C. E. Ligertwood, M.B.: Thesis, A Form of Alcoholic Cardiac Failure; Frank Radcliffe, M.B.: Thesis, Spread of Tuberculosis in Guinea-pigs; C. H. G. Ramsbottom, M.B.: Thesis, The Isle of Man as a Health Resort.

THE ROYAL AQUARIUM JUBILEE PROGRAMME.—Visitors to London will be gratified to learn that no sensational item is announced among the attractions of this popular place of entertainment during the Jubilee and following week, but some of the attractions which are offered should prove both interesting and instructive. The beautiful living pictures which have proved so popular will be continued, but they will now represent Her Majesty's Accession and Coronation, marriage with the Prince Consort, and a number of tableaux illustrative of the fashions and interesting epochs during her sixty years' reign.

THE LATE MR. J. GREIG SMITH.—At the meeting of the committee of the Bristol Royal Infirmary held on June 8th it was unanimously resolved that a vote of condolence be sent to Mrs. Greig Smith, and the committee also recorded their deep regret at the loss the infirmary had sustained by the sudden death of Mr. Greig Smith, as by his great talents and surgical skill he had contributed in an exceptional degree to the success of the work carried on in the wards. It was further agreed that the re-construction of the operation theatre in accordance with a scheme which had been lately suggested by Mr. Greig Smith himself, and in which he took the deepest interest, should be undertaken as a memorial of him, and that a committee should be formed to receive contributions for this purpose.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.—The annual general meeting of this society was held at 40, Leicester-square, on Monday, June 14th, the President, Mr. R. H. Woodhouse, occupying the chair.—The librarian, in presenting his annual report, remarked that there had been an increase in the number of members and visitors who had made use of the library during the year, and that the number of books borrowed had been greater than in previous years.—The curator stated that during the year several valuable additions had been made to the museum, including some excellent specimens illustrating pathological conditions of the teeth in the lower animals. He also appealed to members for gifts of "bone dentures," as specimens of this class of work were becoming day by day more scarce, and he was anxious to have in the museum as good a collection as it was possible to obtain.—The report of the treasurer showed that the receipts had exceeded the expenses by the sum of £26 19*s.* 5*d.*, and that the amount invested stood at £4378 16*s.* 3*d.*—Mr. C. Robbins showed a specimen of a "Home-made Denture." It consisted of a base composed of sheet iron, and to this were fixed three blocks of bone, one being placed on each side and one in front. This denture, which did not conform in any way to the shape of the hard palate, had been tolerated for over thirty years, the curious fact being that the bone block showed not the slightest traces of disintegration. Dr. Grevers, of Amsterdam, read an interesting paper on the Relation of the Bite of the Upper and Lower Teeth. He recounted the various classifications adopted by various authors, and illustrated his points by means of an extensive collection of photographs of skulls from the museums of Amsterdam, Vienna, and Paris. The following gentlemen were elected office-bearers for the ensuing year:—Mr. W. E. Harding, president; Mr. W. H. Woodruff, treasurer; Mr. W. A. Maggs, librarian; Mr. J. F. Colyer, editor of Transactions; Mr. Storer Bennett, curator; and Messrs. J. H. Mummery, H. Baldwin, and J. O. Butcher, honorary secretaries. After the announcement of the ballot the retiring President read his valedictory address, the usual votes of thanks being accorded to the retiring officers. The meeting then terminated.

THE annual dinner of the Epidemiological Society will be held at the Grand Hotel, Trafalgar-square, on Friday, June 25th, at 7.15 P.M. The chair will be taken by the President, and tickets (price 10*s.* 6*d.*) may be obtained from Dr. Bulstrode, 4, The Mansions, Earl's-court, S.W.

MR ALFRED COOPER, F.R.C.S. Eng., has been appointed Surgeon-in-Ordinary to His Royal Highness the Duke of Saxe-Coburg and Gotha, in the room of the late Mr. Wm. Hickman.

THE UNIVERSITY OF WALES.—The number of candidates for matriculation in the University of Wales this year amounts to 425, as against 216 last year and 89 the year before. The Prince of Wales (the Chancellor of the University) has expressed his gratification at this satisfactory proof of its growing prosperity.

A MEETING of the Nottingham Medico-Chirurgical Society was held on May 19th, Dr. Ransom, President, being in the chair.—Mr. Milner showed a case of Molluscum Fibrosum in a woman aged fifty-seven years.—Dr. Tresidder showed a woman, aged forty-five years, suffering from Pigmented Spots on the Nose. He suggested that it might be a case of melanosis lenticularis progressiva.—Dr. Wesley read a paper on Submaxillary Cellulitis. After referring to the anatomical relations of the submaxillary cellular tissue and the distribution of the areolar planes in continuity with it the bacterial element of the disease was discussed. The micro-organism seemed to have been different in individual cases, the most common variety, however, being a streptococcus, this tending to prove that submaxillary cellulitis cannot be truly looked upon as a specific disease. Numerous cases were detailed which showed most of the varieties and the chief complications of the affection. The cases grouped themselves into—first, the very acute ones, in which the constitutional symptoms were severe and which rapidly ended fatally; and, secondly, the less acute cases which have arisen from extension of inflammation from the lymphatic glands, the general symptoms being less severe, and almost always resulting in recovery. Free and early incision was insisted upon in all cases, and the most favourable position for the various cases was discussed. For the anæsthetic chloroform was to be preferred, a local anæsthetic such as ethyl chloride being occasionally useful. In the acutest cases the use of antistreptococcus serum was advocated in addition to incision. Dr. Ransom and Mr. Anderson discussed the subject, and Dr. Wesley replied.—Dr. Bell Taylor read a paper on the Contagious Diseases Act from a Sanitary Aspect. He said that in the army reports of those cases classified as syphilis and invalided as such two-thirds were due to gonorrhœa and nine-tenths of the remainder were due to non-syphilitic sores; neither of these classes presented constitutional symptoms. In the remainder the disease does not present serious symptoms, tertiary signs being rarely seen nowadays. After quoting numerous authorities in support of his hypothesis that exceptional legislation on the subject is not required, Sir H. Campbell-Bannerman and Mr. Shaw-Lefevre were quoted as legislators who had expressed views antagonistic to the Acts. He thought the Acts failed because the disease in woman is often so dormant and with such difficulty detected. He advocated voluntary hospitals. The subject was discussed by Dr. Ransom, Mr. Anderson, Dr. Handford, Mr. Wood, Dr. Bolton, Mr. O'Mullane, and Dr. Tresidder, and Dr. Bell Taylor replied. Finally, the following resolution was proposed by Mr. Anderson, seconded by Mr. Geraty, and carried: "That the society, having considered the question of the prevalence of venereal disease in the army, hopes that the Government will take immediate steps to check its spread."

BOOKS, ETC., RECEIVED.

ASH PARTNERS, LIMITED, London.
The Fairies' Favourite; or, the Story of Queen Victoria told for Children. By T. Mullett Ellis. Commemoration Day, 1897. Illustrated. Price 1*s.*

ASH, C., AND SONS, Broad-street, Golden-square, London.
The Administration of Nitrous Oxide and Oxygen for Dental Operations. By F. W. Hewitt, M.A., M.D. Cantab. 1897. Price 4*s.* net.

BAILLIÈRE, TINDALL, AND COX, King William-street, Strand, London
From Our Dead Selves to Higher Things. A Course of Human

Experience and Progressive Development. By F. J. Gant, F.R.C.S. Second edition. 1897.

Clinical Manual of Mental Diseases. By A. Campbell Clark, M.D. Edin., F.F.P.S. Glasg., University Series. 1897. Price 10s. 6d.

"CAPE TIMES," Printing Works, Cape Town.

The Mineral Waters of Caledon. By G. W. B. Daniell, L.R.C.P. Lond., M.R.C.S. 1897.

CARRÉ ET NAUD, Paris.

Essai sur les Lésions du Foie et des Reins. Par Dr. H. Claude. 1897.

CASSELL AND COMPANY, London.

The Surgical Diseases of Children. By Edmund Owen, M.B., F.R.C.S. Illustrated. Third edition. 1897. Price 21s.

CHURCHILL, J. & A., Great Marlborough-street, London.

Remarks on the Uses of some of the Bazaar Medicines and Common Medical Plants of India. By E. J. Waring, C.I.E., M.D. Fifth edition. 1897. Price 5s.

CONSTABLE, A., AND CO., Westminster.

Memories of Seven Campaigns. By Jas. Howard Thornton, C.B., M.B., B.A. With an Introduction by A. Egmont Hake. Illustrated. 1895.

DOWNEY AND CO., York-street, Covent-garden, London.

A Doctor's Idle Hours. By "Scalpel." 1897. Price 6s.

FRÈRES VIGOT, Paris.

Travaux de Neurologie Chirurgicale (deuxième année). Par A. Chipault. 1897.

FROWDE, HENRY, Amen-corner, London, E.C.

Harvey and Galen. The Harveian Oration, Oct. 19th, 1896. By J. F. Payne, M.D. Oxon. 1897. Price 2s. 6d. net.

GEORGI, A., Leipzig.

Bakteriologie des Weiblichen Genitalkanales. Von Dr. C. Menge und Dr. B. Krönig. Teile 1 und 2. 1897.

KEGAN PAUL, TRENCH, AND CO., Charing-cross-road, London.

B. Bradshaw's Dictionary of Bathing Places and Climatic Health Resorts. With a map. 1897. Price 2s. 6d.

LANE, L. C., in the Office of the Librarian of Congress, at Washington.

The Surgery of the Head and Neck. By L. C. Lane, M.D. (Berol), M.R.C.S. Eng.

LEWIN THOS. AND CO., Amen-corner, Paternoster-row, London.

International Clinics. A Quarterly of Clinical Lectures. Edited by Judson Daland, M.D., J. M. Bruce, M.D., and D. W. Finlay, M.D., F.R.C.P. Aberd. 1895-97 series. Vol. IV. 1897. Price 12s. 6d. net.

LIVINGSTONE, E. AND S., Edinburgh.

Diseases of the Eye. By J. Arthur Kempe, F.R.C.S.

The Students' Handbook of Diseases of the Skin. By Utile Quod Facias. 1897. Price 2s. 6d. net.

LONGMANS, GREEN, AND CO., Paternoster-row, London.

The Value of Electrical Treatment. By Julius Althaus, M.D., M.R.C.P., M.R.I. Second edition. 1897. Price 2s.

MACMILLAN AND CO., London.

The Induction Coil in Practical Work, including Rontgen x Rays. By L. Wright. 1897.

Human Embryology. By Chas. S. Minot. Illustrated. 1897. Price 25s. net.

The Yew-trees of Great Britain and Ireland. By John Lowe, M.D. Edin. 1897. Price 10s.

MASSON ET CIE, Paris.

La Revue Philanthropique. No. 2. 10 Juin, 1897.

MURRAY, JOHN, Albemarle-street, Piccadilly, London.

Waste and Repair in Modern Life. By Robson Roose, M.D., LL.D., F.R.C.P. Edin. 1897. Price 7s. 6d.

NUTT, DAVID, 270, Strand, London.

Cuba: the Guerilla Chief. A Real Romance of the Cuban Rebellion. By P. H. Emerson. 1897. Price 3s. 6d.

Life in Early Britain. By Bertram C. A. Windle, D.Sc., M.D. Dubl. With maps and illustrations. 1897. Price 3s. 6d.

PENTLAND, Y. J., Edinburgh.

The Edinburgh Medical Journal. Edited by G. A. Gibson, M.D., F.R.C.P. Edin. New Series. Vol. I. 1897.

Manual of Bacteriology. By R. Muir, M.A., M.D., F.R.C.P. Edin., and James Ritchie, M.A., M.D., B.Sc. Illustrated. 1897.

SCOTT, WALTER, Paternoster-square, London.

The Psychology of the Emotions. By Th. Ribot. 1897. Price 6s.

SOCIÉTÉ D'EDITIONS SCIENTIFIQUES, Paris.

Formulaire Clinique d'Électrothérapie Spéciale et Appliquée. Par Dr. A. Massey. 1897.

SMITH, ELDER, AND CO., Waterloo-place, London.

Saint Bartholomew's Hospital Reports. Edited by S. West, M.D., and W. J. Walsham, F.R.C.S. Vol. XXXII. 1896-1897.

THACKER, W., AND CO., Creed-lane, London.

Notes on Stable Management in India and the Colonies. By Veterinary-Captain J. A. Nunn, F.R.C.V.S., C.I.E., D.S.O. Second Edition, with a Glossary. 1897.

THE COTTON PRESS, Arundel-street, Strand, London.

Molière and his Medical Associations. By A. M. Brown, M.D. 1897. Price 6s.

Sanitary and Social Questions of the Day. By an Observer. Price 2s.

THE REBMAN PUBLISHING COMPANY, Adam-street, Strand, London.

A Pictorial Atlas of Skin Diseases and Syphilitic Affections in the Museum of the Saint Louis Hospital, Paris. Edited and Annotated by J. J. Pringle, M.B., F.R.C.P. Part 9. 1897. Price 10s. 6d.

THE ROXBURGHE PRESS, Victoria-street, Westminster.

My Father as I Recall Him. By Mamie Dickens. Price 3s. 6d.

VAIL, J. H., AND CO., New York.

A New Classification of the Motor Anomalies of the Eye. By A. Duane, M.D. New York. 1897.

VALLARDI, F., Milano.

La Chirurgia del Collo-Studio Clinico. Par E. Bottini.

VOGEL, F. C. W., Leipzig.

Pathologie und Therapie der Perityphlitis. Von Dr. E. Sonnenburg. 1897.

WARNER, W. R., AND CO., Philadelphia.

Warner's Pocket Medical Dictionary. 1897.

The British Gynæcological Journal, May, 1897; Part 49; edited by F. F. Schacht, M.D. (John Bale, Sons, and Danielsson, Great Titchfield-street, Oxford-street, London). Price 3s. 6d. — Left-hand Writing: a Complete Course of Exercises; by J. Jackson, F.E.I.S. (Sampson Low, Marston, and Co., St. Dunstan's House, London, E.C.).—Schedules for Plant Description; by John Wishart (E. and S. Livingstone, Edinburgh). Price 6d.—Origin of the Vertebrates; by Stuart Jenkins; reprint (G. S. Davis, Detroit, Mich.).—A Contribution to the Natural History of Scarlet Fever, based upon Official Statistical Records of Mortality and Morbidity; by John T. Wilson, M.D., D.P.H Aberd.; Supplement to "Public Health," February, 1897 (W. H. and L. Collingridge, Aldersgate-street, London, E.C.).—Dairy Sanitation; reprint from the "Sanitary Journal" for February, 1897.—Catalogue of the Collections in the Jeypore Museum; compiled by T. H. Hendley, C.I.E.; Parts 1 and 2 (Imperial Medical Hall Press, Delhi, 1896).—Des Ulcères Simples de l'Intestin; par Ch. Combes (Lurrien, Senior, Toulouse, 1897).

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week for publication in the next number.

BARKER, T., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Haxey Sanitary District of the Gainsborough Union.

BIRMINGHAM, A., M.D., L.R.C.P. Irel., has been appointed a Resident Surgeon to the Mater Misericordiæ Hospital, Dublin.

COPEMAN, A. H., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Littleport Sanitary District of the Ely Union.

DYER, C. HAROLD, M.B., C.M. Aberd., has been re-appointed Medical Officer of Health by the Cleckheaton Urban District Council.

EGLINTON, G. W., L.R.C.P. Edin., L.F.P.S. Glasg., has been re-appointed Medical Officer of Health for the Street Urban Sanitary District.

FARRAR, JOS., M.D. St. And., L.R.C.P., L.R.C.S. Edin., has been appointed Medical Officer for Gainsborough and for the Workhouse.

FAULKNER, W. C., M.B. Edin., has been appointed Medical Officer to the Mount Bischoff Tin Mining Company and the Bischoff Provident Hospital, Waratah, Tasmania.

FLEMMING, PERCY, F.R.C.S. Eng., M.D., B.S. Lond., has been appointed Assistant Ophthalmic Surgeon to University College Hospital, London.

FRIPP, A. D., M.S. Lond., has been appointed an Assistant Surgeon to Guy's Hospital, London.

GAYLOR, E., L.R.C.P. Edin., L.F.P.S. Glasg., has been re-appointed Medical Officer of Health by the Ripley Urban District Council.

HALL, C. R., L.R.C.P. Edin., M.R.C.S., has been appointed Medical Officer for the Third Sanitary District of the Hatfield Union, vice L. F. Osbaldeston.

HAMILTON, P. J., M.B., B.Ch. Irel., has been appointed a Resident Surgeon to the Mater Misericordiæ Hospital, Dublin.

HARRIS, H., L.R.C.P., L.R.C.S. Edin., has been appointed Medical Officer for the No. 9 Sanitary District of the Bedminster Union.

HARWOOD, E. F., L.R.C.P. Lond., M.R.C.S., has been appointed an Assistant Medical Officer for the Infirmary by the Brentford Board of Guardians.

HELM, R. D., M.D. Edin., has been appointed a Physician to the Cumberland Infirmary, vice S. Lockie.

JAMES, PHILIP, F.R.C.S. Eng., L.R.C.P. Lond., has been appointed Official Railway Medical Officer for the Wellington Section of the New Zealand Government Railways.

KERR, T. B., M.B., B.Ch. Irel., has been appointed a Resident Surgeon to the Mater Misericordiæ Hospital, Dublin.

MANNERS, A., M.R.C.S., L.R.C.P. Edin., has been appointed Medical Officer for the First Sanitary District and Workhouse of the Pewsey (Wiltshire) Union, vice H. Colman, resigned.

MARSHALL, E. W., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the No. 6 Sanitary District of the Croydon Union.

MCKENZIE, H. V., M.D. Edin., has been appointed Ophthalmic Surgeon to the Torbay Hospital and Eye Infirmary, Torquay.

MOORE, W. H., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Kidderminster Workhouse, vice S. Stretton, resigned.

MUNRO, D., M.D., L.R.C.S. Edin., has been appointed Medical Officer for the Aberfeldy Sanitary District.

ROBINSON, JOSEPH, L.R.C.P. Irel., L.F.P.S. Glasg., has been appointed Medical Officer for the No. 1 Sanitary District of the Kidderminster Union, vice S. Stretton, resigned.

ROWBOTHAM, A. J., M.R.C.S., has been re-appointed Medical Officer for the Newton Sanitary District of the Gainsborough Union.

RUSSELL, R. HAMILTON, F.R.C.S. Eng., has been appointed Surgeon to In-patients at the Melbourne Hospital for Sick Children, Australia.

SCOTT, G. W., M.B., B.Sc., has been appointed House Physician to the Infirmary, Sunderland.

SHARPLEY, J. E., L.R.C.P. Lond., M.R.C.S., has been re-appointed Medical Officer for the Blyborough Sanitary District of the Gainsborough Union.

SLADER, G. W. B., L.R.C.S. Irel., has been appointed Medical Officer for Blyton of the Gainsborough Union.

SMITH, LIONEL, M.R.C.S., L.R.C.P., has been appointed Resident Medical Officer to the Westminster General Dispensary, Soho, vice Frederick Green, resigned.

SMYTH, W. A., L.R.C.P., L.R.C.S. Edin., has been appointed Medical Officer for the Ashtead Sanitary District of the Epsom Union.

SNOAD, P. E., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the No. 6 Sanitary District of the Leicester Union.

STENHOUSE, DANIEL, L.R.C.P., L.R.C.S. Edin., has been appointed Medical Officer for the Parish of Arnold of the Basford Union.

STEPHENS, L. E. W., M.R.C.S., has been appointed Medical Officer for the Workhouse, and for the No. 1 Sanitary District of the Westbourne Union.

STUART, J. A. ERSKINE, L.R.C.P. Edin., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the Borough of Batley, Yorkshire.

THOMPSON, C. S., M.B., C.M. Edin., has been re-appointed Medical Officer for the Abbotsham Sanitary District of the Bideford Union.

TOWNSEND, NORMAN J., L.R.C.P., L.R.C.S. Irel., has been appointed Extern Physician to the Cork South Infirmary and County Hospital.

WILLIS, W. MORLEY, F.R.C.S. Eng., has been appointed House Surgeon to the Infirmary, Sunderland.

WIGHAM, WM. H., M.B. Durh., M.R.C.S., has been appointed Medical Officer and Public Vaccinator for the Ninth Sanitary District of the South Molton Union, vice A. Hind, resigned.

YOUNGER E. G., M.D. Brux., M.R.C.P. Lond., M.R.C.S., has been appointed Sanitary Inspector for the Gray's Inn (Holborn) Sanitary District.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index)

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL.—House Surgeon for six months. Honorarium £10 10s., board, lodging, and washing provided.

BRIDGWATER INFIRMARY.—House Surgeon. Salary £80 per annum, with board and residence.

CHORLTON UNION.—Senior and Junior Resident Medical Officers at the Workhouse Hospitals, Withington, Manchester, for twelve months. Salary of the former at the rate of £130 per annum, and of the latter at the rate of £120 per annum, each with furnished apartments and attendance (but not rations) in the Workhouse. Applications to the Clerk to the Guardians, Chorlton Union Offices, All Saints, Manchester.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria-park, E.—House Physician for six months. Salary at the rate of £30 per annum. Board and residence provided.

CONSUMPTIVE HOSPITAL AND ORPHAN HOMES OF SCOTLAND, Bridge-of-Weir.—Resident Medical Officer. Salary £80 per annum, with furnished apartments, board, &c. Applications to the Secretary, 194, St. Vincent-street, Glasgow.

COUNTY BOROUGH OF ST. HELENS.—Medical Officer of Health, Public Analyst. Salary £400 per annum, rising by five equal annual instalments to £520 per annum. Preference will be given to candidates qualified to act as Public Analyst, an office to which an additional salary of £75 per annum will attach. Applications to the Town Clerk, Town Hall, St. Helens.

DISTRICT ASYLUM, Mullingar.—Medical Woman as Junior Assistant Medical Officer, unmarried. Salary £100 per annum, with board, furnished apartments, attendance, and laundry.

GENERAL HOSPITAL, Nottingham.—Assistant House Physician for six months. Board, lodging, and washing in the hospital. An honorarium of £10 10s., will be given conditionally.

GENERAL INFIRMARY, Leeds.—Locum Tenens for Resident Surgical and Casualty Officer for five weeks from June 29th. Two guineas per week.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident House Physicians.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, Bloomsbury.—Resident Medical Superintendent for one year. Salary £105 a year, with board and residence in the hospital.

HULL ROYAL INFIRMARY.—Junior Assistant House Surgeon for one year. Salary £40, with board and lodging.

MONKWEARMOUTH AND SOUTHWICK HOSPITAL, Sunderland.—House Surgeon, unmarried. Salary £80 per annum, with board, residence, and washing.

MONTROSE ROYAL ASYLUM, Sunnyside, Montrose, N.B.—Senior Assistant Medical Officer, unmarried. Salary £200 per annum, with board, furnished apartments, and washing.

NOBLES, ISLE OF MAN GENERAL HOSPITAL AND DISPENSARY, Douglas, Isle of Man.—Resident House Surgeon, single. Salary £90 per year, with apartments, gas, coals, and washing free. The House Surgeon is usually appointed Medical Attendant at the House of Industry at a salary of £10 per year.

NORFOLK AND NORWICH HOSPITAL.—House Physician for two years unmarried. Salary £60 per annum, with board, lodging, and washing.

PARISH OF ST. PANCRAS, London.—Dispenser. Applications to the Clerk to the Guardians, Vestry Hall, Pancras-road, N.W.

ROYAL EYE HOSPITAL, Southwark, or ROYAL SOUTH LONDON OPHTHALMIC HOSPITAL.—House Surgeon. Salary £50 per annum, with free board and lodgings in the hospital.

UNIVERSITY COLLEGE, BRISTOL, FACULTY OF MEDICINE.—Professor of Surgery.

WANTAGE UNION.—Medical Officer and Public Vaccinator for the Vale District. Salary £50 per annum, with the usual surgical, vaccination, and midwifery fees. Applications to the Clerk to the Guardians, Wantage.

WEST HAM HOSPITAL, Stratford, E.—Secretary. Salary £150 per annum.

Births, Marriages, and Deaths.

BIRTHS.

ATKINSON.—On June 5th, at Newton House, Knaresborough, the wife of Jackson A. Atkinson, M.R.C.S., L.R.C.P. Eng., of a son.

COCKEY.—On June 12th, at Esher House, Ladbroke-grove, W., the wife of E. Percival Cockey, M.D., of a son.

COYSH.—On June 7th, at Chiswick High-road, Gunnersbury, W., the wife of T. A. Coysh, L.D.S. Eng., of a son.

CROUCH.—On June 8th, at Weston-super-Mare, the wife of Charles Percival Crouch, F.R.C.S., M.B., of a daughter.

HAZLETON.—On June 8th, at The Hazels, Matlock, Derbyshire, the wife of Edward B. Hazleton, M.D., of a daughter (Vera Brooke).

LAST-SMITH.—On June 11th, at Mayfield, Torquay, the wife of Edward Last-Smith, J.P., L.R.C.P., L.R.C.S., of a daughter.

LEES.—On June 8th, at Winchester House, Worthing, the wife of Bernard Lees, M.A., M.B., of a daughter.

LUMSDEN.—On June 11th, at Lower Leeson-street, Dublin, the wife of J. Lumsden, M.D., of a son.

MAISEY.—On June 12th, at 137, Cheetham Hill-road, Manchester, the wife of C. T. B. Maisey, M.R.C.S., L.R.C.P. Lond., of a daughter.

MANSBRIDGE.—On June 13th, at Grosvenor-gardens, Willesden-green, N.W., the wife of Josiah Mansbridge, L.R.C.P., M.R.C.S., of a son.

SANDERS.—On June 13th, at Edinburgh, the wife of Gordon Sanders, M.D., F.R.C.P. Edin., of a son.

WILSON.—On June 10th, at Carlton-villas, Cricklewood, N.W., the wife of G. Morton Wilson, M.B., of a son.

MARRIAGES.

ARTHUR—MAAS.—On June 9th, at St. James's Church, West Hampstead, Francis Arthur, M.R.C.S., L.R.C.P., of La Pompe, Jersey, to Marie, daughter of the late Leopold Maas, of West Hampstead.

COOKE—COGILL.—On June 15th, at S. Mark's, Surbiton, by the Rev. G. Kennedy Cooke, brother of the bridegroom, and the Ven. Archdeacon Burney, Vicar of S. Mark's, Albert William Cooke, M.R.C.S., L.R.C.P., to Jessie, younger daughter of William Henry Cogill, Esq., of Surbiton.

DANIEL—ZAIR.—On June 16th, at Solihull Parish Church, Edgar George Clement Daniel, M.A., M.B. Cantab., eldest son of William Clement Daniel, M.D., of Epsom, to Maud Satchell, second daughter of George Zair, of Solihull, Warwickshire.

GORDON—BLAKE.—On June 2nd, in Renvyle Church, co. Galway, Thomas Eagleson Gordon, M.B., F.R.C.S. Irel., of 55, Lower Baggot-street, Dublin, to Nellie, only daughter of the late Ethelstane Blake, Esq., of Heath Island, Renvyle, co. Galway.

HARPER—GIBBS.—On June 10th, at Sonning Church, near Reading, John Robinson Harper, of Barnstaple, L.R.C.P. Lond., M.R.C.S. Eng., to Eva Antonia Hennensjelda Gibbs, daughter of the late Joseph Gibbs, of Lexham-gardens, London.

MAXWELL—WOOTTON.—On June 9th, at Christ Church, Mayfair, Robert Fawcett Maxwell, L.R.C.P., L.R.C.S., of Uxbridge-road, W., to Rose Charlotte, daughter of George Wootten, of Findon-road, Uxbridge-road, W.

REED—COLLINS.—On June 12th, at Christ Church, Epsom, Surrey, John Charles Groscort, Surgeon Royal Navy, only son of the late Surgeon-Major John Groscort Reed, M.D., H.E.I.C.S., to Mary Hammett Vining, only child of the late J. H. Collins, Esq., F.R.C.S., District Surgeon, E.I.R., of Sunnyside, Epsom.

RIGBY—ATKINSON.—On June 16th, at St. Saviour's Church, Liverpool, by the Rev. Richard M. Ainslie, Walter Rigby, M.B., C.M. Edin., of Blackburn, to Gertrude Minta Atkinson. No cards.

ROPER—CODDINGTON.—On June 9th, at the Parish Church, Blackburn, Herbert John Roper, M.R.C.S., of Leeds, to Mildred Elizabeth, eldest daughter of the late Albert Edward Coddington, of Blackburn.

SAVAGE—FISHER.—On the 9th inst., at St. George's Church, Edgbaston, Arthur Thomas Savage, B.A., L.R.C.P., Olton, Birmingham, to Beatrice Louise, second daughter of Walter Newton Fisher, J.P., Lawnfield, Edgbaston.

SMITH—SHARP.—On June 14th, at the Church of St. Bartholomew the Great, Thomas Rudolph Hampden Smith, F.R.C.S., of Stockton-on-Tees, to Ann Ellen Sharp, daughter of the late William Sharp.

DEATHS.

ATWOOL.—On June 11th, at Tunbridge Wells, in his thirtieth year, William Tillinghast Atwool, late Ophthalmic Surgeon to the Torbay Hospital.

HODGSON.—On June 5th, at Montpelier-road, Brighton, George Frederick Hodgson, M.R.C.S., L.S.A., aged 75 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, June 17th, 1897.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Dry Bulb	Wet Bulb.	Solar Radia in Vacuo.	Maximum Temp. Shade.	Min. Temp	Rainfall.	Remarks at 8.30 A.M.
June 11	30·30	S.W.	64	59	125	78	53	...	Fine
,, 12	30·29	S.W.	69	62	125	84	57	...	Fine
,, 13	30·35	S.E.	77	64	129	86	62	...	Fine
,, 14	29·97	W.	68	63	116	87	63	...	Cloudy
,, 15	30·20	N.W.	64	55	120	77	56	...	Cloudy
,, 16	29·75	S.W.	61	56	122	70	53	0·02	Overcast
,, 17	29·86	N.W.	55	49	116	61	49	...	Cloudy

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (21st).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M., Ophthalmic 1.15 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), St. Mark's (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), Westminster (2 P.M.).

TUESDAY (22nd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (2 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.).

WEDNESDAY (23rd).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.).

THURSDAY (24th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.). St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.)

FRIDAY (25th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M., Ophthalmic 10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.).

SATURDAY (26th).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Cancer (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (21st).—LONDON POST-GRADUATE COURSE.—London Throat Hospital, Gt. Portland-st., W., 8 P.M., Dr. Woakes: Nasal Neurosis.

TUESDAY (22nd).—LONDON POST-GRADUATE COURSE.—Hospital for Skin Diseases, Blackfriars, 4.30 P.M., Dr. Abraham: Early Syphilitic Eruptions.

WEDNESDAY (23rd).—LONDON POST-GRADUATE COURSE.—Parkes Museum, Margaret-street, W., 4.30 P.M., Prof. A. Wynter Blyth: Disinfection and Disinfectants.

HOSPITAL FOR CONSUMPTION, &c., (Brompton).—4 P.M. Dr. S. Martin: Aortic Stenosis.

WEST LONDON POST-GRADUATE COURSE (West London Hospital, W.).—5 P.M. Dr. D. Hood: Epilepsy and Allied Conditions.

THURSDAY (24th).—ROYAL COLLEGE OF PHYSICIANS (Examination Hall, Savoy, W.C.).—5 P.M. Dr. W. Hale White: The Means by which the Temperature of the Body is maintained in Health and Disease. (Croonian Lecture.)

LONDON POST-GRADUATE COURSE.—Brit. Inst. of Preventive Medicine, Gt. Russell-st., W.C., 3.30 P.M., Dr. Allan Macfadyen and Mr. A. G. Foulerton: Methods of Search for Specific Micro-organisms.—Central London Sick Asylum, Cleveland-st., W., 5.30 P.M., Mr. J Hopkins: Clinical Lecture.

THE HOSPITAL FOR SICK CHILDREN (Medical School, Gt. Ormond-street, W.C.).—Dr. Garrod: Cases from the Out-patients' Department.

FRIDAY (25th).—ST. GEORGE'S HOSPITAL MEDICAL SCHOOL (Hyde-park-corner, S.W.)—5 P.M. Dr. P. Manson: Diseases of Tropical Climates.

LONDON POST-GRADUATE COURSE.—King's College, 3 to 5 P.M., Prof. Crookshank: Tetanus, Rabies, and Cholera.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC (Bloomsbury).—3.30 P.M. Mr. Gunn: Extra Ocular Muscles.

Notes, Short Comments, and Answers to Correspondents.

EDITORIAL NOTICE.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side of the paper only, AND, WHEN ACCOMPANIED BY BLOCKS, IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

"THE SUPPLY OF TETANUS ANTITOXIN."

To the Editors of THE LANCET.

SIRS,—We read with interest Mr. Arthur H. Buck's letter in THE LANCET of June 12th regarding the supply of antitoxins when city warehouses are closed. There should be no difficulty in obtaining supplies of Messrs. Burroughs, Wellcome, and Co.'s therapeutic serums in every large town, and we have no doubt that many chemists, like ourselves, make a point of stocking such preparations. We can supply all or any of the serums, hypodermic "tabloids," and emergency or regular preparations on Sundays, holidays, or when Messrs. Burroughs, Wellcome, and Co.'s offices are closed.

We are, Sirs, yours truly,

Regent street, W., June 16th, 1897. J. MUNRO AND CO.

THE VALUE OF MEDICAL SERVICE.

A WELL-MERITED rebuke was administered to the executors of a Mrs. Howells, whose estate at her death amounted to nearly £10,000. Mr. T. W. Burwood, of Ealing, attended the deceased lady for cancer of the bowel from Dec. 9th to the 31st, charging 10s. 6*d.* a visit for twenty-six visits, including small operations. The trustees, Messrs. Gilbert, of Avenue-crescent, Acton, disputed the claim and paid into court £9 10s., but the jury found for the plaintiff for the full amount. The case was tried before his Honour Judge Bagshawe at the Brentford County Court, and in giving judgment his Honour remarked that "to defend such a case for the trifling difference between £9 10s. and £14 seems to me putting the estate of the deceased lady to an expense which it was injudicious to incur." Taking into consideration the fact that the patient lived out of the district and the serious nature of the case, the medical attendant's fees do not seem to have been at all high; but the case illustrates the estimate which a certain class of people have of the value of medical service.

CATARRHAL JAUNDICE.

To the Editors of THE LANCET.

SIRS,—I should be very glad if some of your readers would give me their experience of such cases and advise me, especially as to diet, what they have found to answer best. My case is that of a young man, aged thirty-two years, who has also cardiac disease and has been suffering from jaundice for the past four months, otherwise he has been very healthy and did not know of the heart mischief until he was examined at the beginning of this attack. There is slight enlargement of the liver, but little or no pain, and he has lost considerably in weight. The skin and conjunctivæ keep very deeply stained, notwithstanding the long treatment, first with alkalies and Carlsbad aperients, and latterly with dilute nitro-muriatic acid and nux vomica, combined occasionally with digitalis. He is not troubled much with itching or constipation, but the motions keep very pale and the urine deep-red though abundant. As nothing that I have done seems to be of any use, I should be very pleased to have a reply from anyone interested in these cases through the medium of THE LANCET. I am, Sirs, yours truly,

June 14th, 1897. PERPLEXED.

G. G. S. M.—We never give medical advice or recommend medical men by name. Our correspondent is advised to take the opinion of the medical practitioner whom he has already seen, who will tell him if a consultation is required.

THE LATE DR. J. C. LISBOA.

DR. J. C. LISBOA, whose death occurred on May 1st, held a prominent position in medical and scientific circles in Bombay. He was born in Assagaum, a little village in Goa, Portuguese India, in 1823, and went to Bombay for the purpose of studying medicine just four months before the Grant Medical College commenced to receive students. Within a month after passing out of the college on the completion of his five years' course he was made assistant to the surgeon of the Sir Jamsetjee Jejeebhoy Hospital, and assistant to the professor of anatomy in the Grant Medical College. A month later Dr. Morehead, principal of the college, gave him an interim appointment as lecturer on anatomy in the college, and selected him to do duty as a surgeon in the above-mentioned hospital, the records of which for 1851 refer in complimentary terms to his services. The late Dr. Vandyke Carter, in his book on "Leprosy" gives him the credit of having been the first in India to take up the study of that disease. Botany, however, was the subject on which his reputation was mainly founded. Among his numerous writings on this science may be mentioned various papers contributed to the Bombay Branch of the Royal Asiatic Society and the Bombay Natural History Society on the "Mahableshwar Plants," "Plants not mentioned in Dalzell and Gibson's Bombay Flora," "Grasses of the Bombay Presidency," and "Useful Plants of the Bombay Presidency." Two grasses are named after him, Tripogon Lisboæ and Andropogon Odoratus Lisboæ, the latter of which is said by the late Dr. Dymock and his two associates in their "Pharmacographia Indica" to have been discovered by his wife. Dr. Lisboa was elected Syndic (Medicine) of Bombay University, President of the Grant College Medical Society for ten years, and of the Medical Union for four years. He was a member or fellow of many scientific associations, among which may be mentioned the Royal Academy of Sciences of Lisbon and the Linnean Society of London.

Distressed One.—If our correspondent has the various conditions hinted at no time should be lost in consulting the family practitioner as to the course to be adopted. We do not recommend either medical men or treatment.

"THE MORAL EDUCATION OF BOYS."

To the Editors of THE LANCET.

SIRS,—May I answer "Father's" question asked in your issue of June 12th, p. 1649? My essay "Morality," price 1s. 6d., tenth edition, is published by Messrs. J. and A. Churchill, 7, Great Marlborough-street. Possibly "Father" may refer to a letter of mine headed "The Grave Social Problem" which appeared in THE LANCET about fifteen years ago. If so, I will with pleasure send him a copy of it on application. By your kindness a few dozen copies of it were printed on slips and sent to me at the time.—I am, Sirs, yours truly,

MAURICE C. HIME

(For twenty years head master of Foyle College, Londonderry).

Hillmount, Londonderry, June 13th, 1897.

*** We congratulate Mr. Hime on the notice which his book has received, for we have had numerous letters answering "Father's" query by referring to this work.—ED. L.

To the Editors of THE LANCET.

SIRS,—Your correspondent "Father" will find what he requires in "The Special Temptation of Early Life," by C. G. Wheelhouse, F.R.C.S., published at the request of the Ripon Diocesan Conference by Messrs. Walker and Laycock, Printers, 37, Briggate, Leeds.

I am, Sirs, yours faithfully,

June 12th, 1897. PATERFAMILIAS.

WANTED A HOME.

To the Editors of THE LANCET.

SIRS,—Will you allow me, through the columns of THE LANCET, to ask if any of your readers can inform me of a home for inebriates where a young man, unfortunately addicted to alcohol, would be admitted in return for his services as servant, &c.? He is very respectable, well-educated, most anxious to be kept from the temptation of "drink," but is now too poor to be able to pay a fee.

I am, Sirs, yours faithfully,

June 12th, 1897. L.R.C.P.Edin.

X. Y. Z.—When a man holds a public position, as the subject of the paragraph in question does, a certain amount of newspaper notice is inevitable, however regrettable.

THE STATISTICS OF THE ANTITOXIN TREATMENT OF DIPHTHERIA.

MR. LENNOX BROWNE writes to us to dispute the inferences we drew in an article in THE LANCET of June 12th, p. 1621, upon the mortality statistics of diphtheria in the hospitals of the Metropolitan Asylums Board since the introduction of the treatment by antitoxin. He thinks that the very low mortality—10·8 per cent. (or 6·4 per cent. if the "moribund" patients be excluded)—amongst those not treated by antitoxin should be taken into account in any comparison of the antitoxin years with the pre-antitoxin years. We fail to see the necessity for this, since it is expressly stated that (save at one hospital) only the very mildest cases, or those which were obviously moribund on admission, were excluded from this treatment. Supposing that every such case had been given a minimal dose of antitoxin, would that have altered his opinion of the remedy? To our thinking the reporters acted wisely in basing their comparative statistics upon the results of all cases admitted during the year, although the argument in favour of antitoxin is immensely strengthened by the fact that the cases in which it was used comprised the more severe types. Nor can we admit with him that the decline in the mortality, which is especially noticeable in 1895 and 1896, is to be attributed to "better local treatment and more vigilant nursing care." If so, how can we explain the much greater proportional decline in the mortality of post-scarlatinal diphtheria?

"INCUBATORS."

To the Editors of THE LANCET.

SIRS,—We notice an inquiry as to where incubators for babies can be procured in England. We keep a stock of these incubators for either sale or hire, we did this at the suggestion of Dr. Champneys, and they will be found on p. 847, Fig. 3227, of our last illustrated catalogue of surgical instruments and appliances. We shall be pleased at any time to show these incubators to your correspondent.

We are, Sirs, yours faithfully,

26, West Smithfield, E.C., June 14th, 1897. ARNOLD AND SONS.

To the Editors of THE LANCET.

SIRS,—If "H. G. C." will refer to Section 1543:1 of the "Medical Digest," 1890 edition, and Appendix, he will be able to obtain all the information he desires. "Father" will also find references to much instructive literature upon the "Moral Education of Boys" in Sections 1083 and 1084 of the same work.—I am, Sirs, yours truly,

June 14th, 1897. RICHD. NEALE, M.D.Lond.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

During the week marked copies of the following newspapers have been received:—*Herald of Wales, Sheffield Independent, Evesham Journal, Rugby Advertiser, Banbury Guardian, Derby Express, Manchester Courier, Bradford Observer, Tamworth Mercury, Kidderminster Times, Western Morning News, Portsmouth Times, Berrow's Worcester Journal, Oldham Standard, Times of India, Pioneer Mail, Science Siftings, Le Temps, Doncaster Chronicle, East Anglian Daily Times, Architect, Salisbury Journal, Devon Weekly Times, Liverpool Daily Post, Walsall Observer, North Wilts Herald, Brisbane Courier, Builder, Croydon Guardian, Sussex Daily News, Birmingham Mail, South Wales Daily News, Glasgow Herald, Daily Chronicle, Chard News, Yorkshire Post, Barnsley Independent, Newcastle Leader, Leeds Mercury, Brighton Gazette, City Press, Bristol Mercury, Public Health Journal (New York), Forest Gate Weekly News, Hertfordshire Mercury, Printing Trades' Gazette, Weekly Free Press and Aberdeen Herald, Mining Journal, Local Government Chronicle, Reading Mercury, Sanitary Record, Braintree and Bocking Advertiser, Local Government Journal, Southern Daily Mail (Portsmouth), Surrey Advertiser, Mandalay Herald, Huddersfield Examiner, Evening Telegraph (Dundee), Tyrone Constitution, Kirkcudbright Advertiser, Loughborough Monitor, Ayr Advertiser, South Africa, Stowmarket Courier, Penarth Chronicle, Lisburn Standard, West Middlesex Herald, &c., &c.*

Communications, Letters, &c., have been received from—

A.—Dr. H. B. Allen, Melbourne; Mr. W. Armstrong, Lond.; Dr. J. Althaus, Lond.; Addressograph Co., Glasgow; A. B., Lond.; Dr. J. Adam, West Malling; Messrs. Arthur and Co., Lond.; Aloes, Lond.; Signor Carlo Albanese, Palermo, Sicily.

B.—Messrs. Belshaw and Co., Lond; Messrs. Burgoyne, Burbidges, and Co., Lond.; Mrs. R. M. Birt, Lond.; Messrs. Burroughs, Wellcome, and Co., Lond.; Messrs. H. P. Bulmer and Co., Hereford; Mr. J. Braithwaite, Leeds; Dr. G. A. Bolton, Lond.; Dr. G. S. Buchanan, Lond.; Mr. C. A. G. Browne, Lond; Dr. Bury, Manchester; Mr. E. S. Bishop, Manchester; Birmingham and Midland Ear and Throat Hospital, Secretary of.

C.—Dr. T. Cherry, Melbourne; Mr. A. C. Champati, Krishnaggar, India; Mr. J. D. Campbell, Lond.; Mr. S. N. Corlett, Lond.; Dr. Cullingworth, Lond; Mr. W. H. B. Crockwell, Manchester; Messrs. Crossley, Moir, and Co., Lond; Mr. F. W. Clarke, Manchester; Dr. F. Graham Crookshank, Lond.

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